THE AMERICAN
School Board Journal

A PERIODICAL OF SCHOOL ADMINISTRATION

Devoted to the Interests of School Boards, Superintendents,
School-Business Officials, and School Architects

VOLUME 86
JANUARY—JUNE, 1933

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THE AMERICAN
School Board Journal

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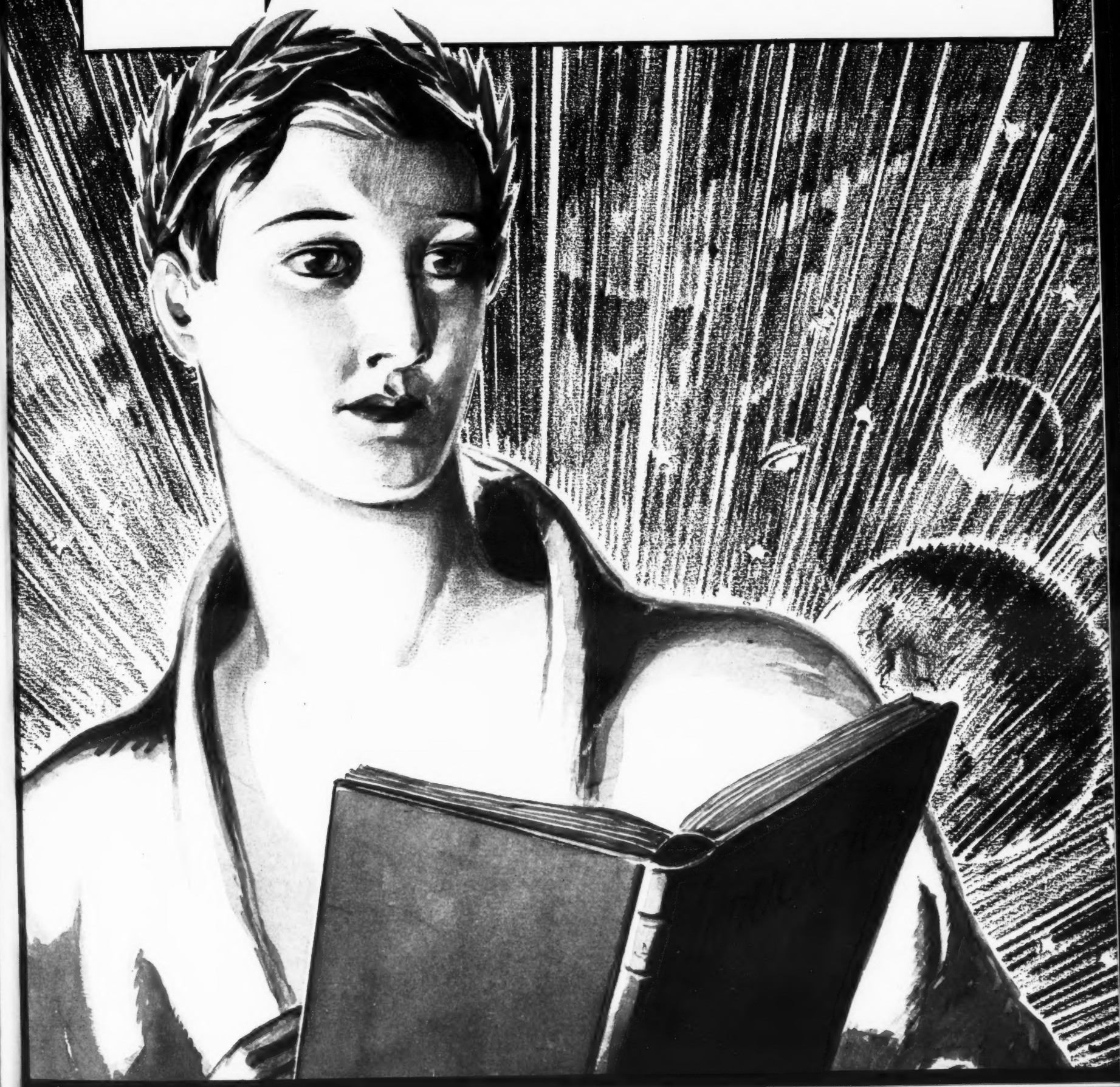

JANUARY 1933

HIRTY-THIRD ANNUAL SCHOOL BUILDING NUMBER

THE BRUCE PUBLISHING COMPANY • MILWAUKEE, WISCONSIN

HEALTHIER, HAPPIER, BRIGHTER CHILDREN

Thanks to the School Superintendents and Principals who gave them **THIS**

Daisy is a nice dog
She goes To school
She cries loud
Daisy is Mary's dog
She is very little
Daisy has black and brown
Spots on his back
Mary feeds Daisy meat and bones

In place of THIS

In the field of Education standards are moving steadily forward

PARENTS and parent-teacher organizations the country over owe a vote of thanks to School Superintendents, Principals and School Boards. For the facts are that despite restricted budgets, standards of education are moving steadily forward. More and more children are being provided with better environment—with modern equipment that assures proper physical as well as mental development.

Improved ventilation, sanitation and lighting are instances of this. And more so, the movement to replace obsolete seats with posturally correct seats. Scores of school executives have found that such reseating gives students seats that make it *easy* and *natural* to sit erect—that prevent vital organs such as the heart and lungs from being cramped and crowded.

You, as a teacher, will find posturally correct seating makes it easier for you to teach—produces more efficient students—eliminates much of the restlessness and fidgeting that is ever present with obsolete seating. Pride in your classroom, in your school—higher standards of efficiency—and greater success for you make seating a subject in which you should take an active interest.

Reseat With American Universal Desks

Reseating with American Universal Desks is not only important to the health and educational advantages of the student, but its comparative economy makes it possible and advisable as well. The upper photograph shows a modern classroom equipped with American Universal Desks—grouped in table formation, with the level top-adjustment device converting the study position of the top to a level table top. Note—how perfectly and easily these children work in comparison to those in the lower photograph, who are bent over their work in deplorable postures. Superintendents and Principals are invited to write us (or use coupon below) on matters pertaining to seating and posture. The booklets listed below are informative, instructive and vitally interesting. For they cover a subject—correct posture seating—from a scientific, educational and efficiency viewpoint.

Free Classroom Posture Poster and Authoritative Seating Booklets . . .

Send the coupon . . . and we will mail you free a three-color posture poster size 17½ x 25 inches, which shows children why they should sit *erect*. Teachers, principals or superintendents will be supplied with a poster for each class-room on request. With them, too, any of the following authoritative, instructive and interesting booklets: *"Essentials of Hygienic Seating"*, which shows what constitutes good and bad posture, the relation of seating to posture, adjustment of seats, desks, and lighting and seating arrangements . . . *"Ideals and Standards of Classroom Seating"*, covering the essentials of good seating and the grade distribution of school desk sizes . . . *"The Relation of Posture to Tuberculosis"* . . . *"The Buying of School Equipment"* . . . and *"Forty Years of School Seating"*. Please use the coupon, indicating the booklets you wish.

(They contain no advertising)

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Please send me, without obligation, a copy of your Posture Poster and copies of the booklets checked.

Name .....

Address .....

Position ..... ☐ Number of classrooms

(Indicate here whether you are a Superintendent, Principal or Teacher)

☐ Ideals and Standards of Classroom Seating
☐ Essentials of Hygienic Seating
☐ The Relation of Posture to Tuberculosis
☐ Forty Years of School Seating
☐ The Buying of School Equipment (A.S.B.1)

It's off the Press!

The collaboration of leading architectural firms gives to this book its interesting sections on school planning

The nation-wide co-operation of leading school authorities has made possible the separate sections on the requirements of changing curricula.

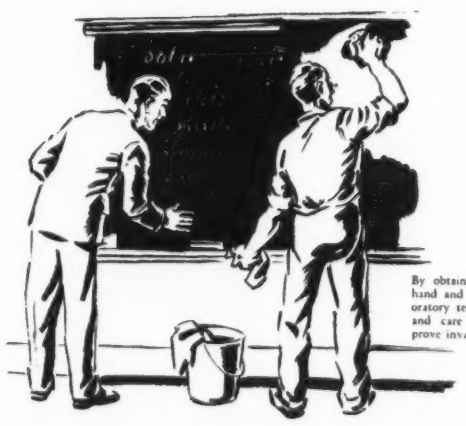
The book compiled by experts on visual instruction

THIRTY-TWO pages printed on a beautiful paper stock and bound in an art cover. Chapters discussing the requirements of changing instruction methods, tables giving chalk rail heights for ev ery grade.

Beautiful photographs and detail drawings, plans and specifications, compiled as a result of a year of work with leading school architects and authorities. Every department in the school is covered from kindergarten to college. Special means of visual instruction for special departments. Domestic Science, vocational training and industrial art divisions will interest you.

Pages of specifications and methods of erection are some of the features of a book, termed by those who have read it, as the centralized source of authoritative information. Start the new year with this book in your library. We will send it free to those engaged in school work.

In fulfilling the needs and anticipating the demands of teachers the book contains many practical sections as a result of a country-wide survey in the classroom itself.



By obtaining maintenance data first hand and checking results with laboratory tests the chapter on cleaning and care of blackboards alone will prove invaluable.

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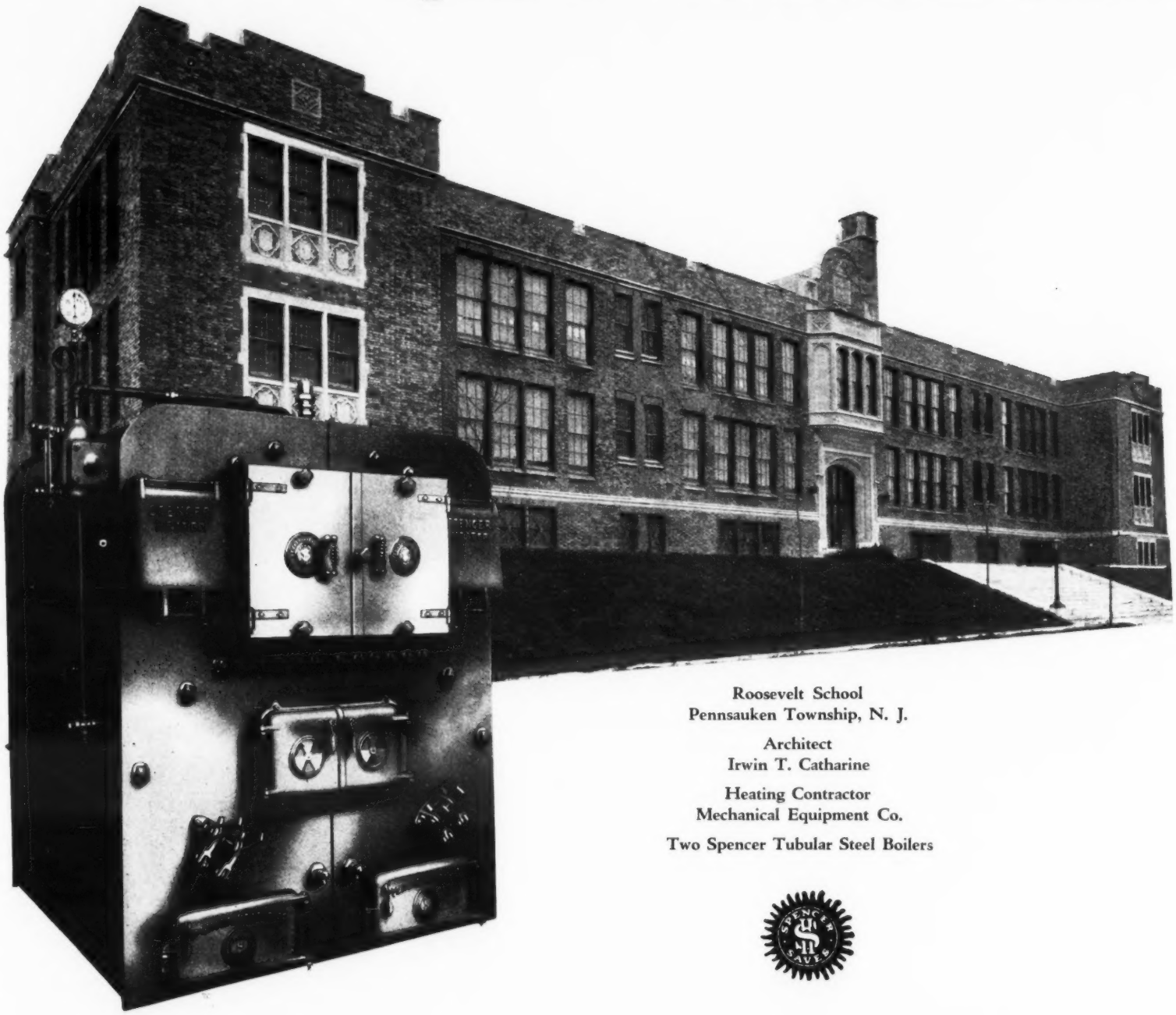
Spencer Automatic Heat



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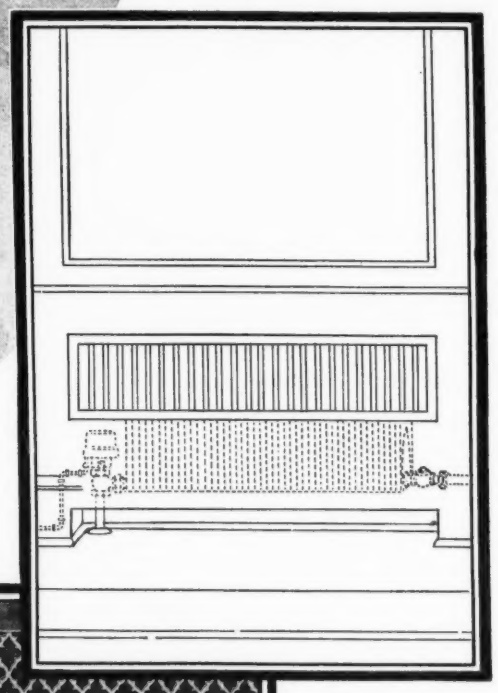
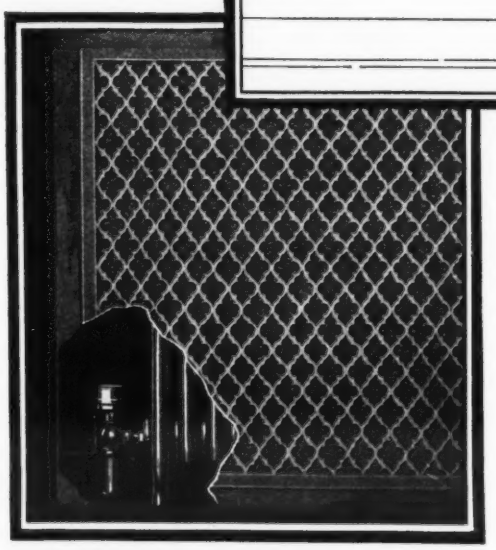
Concealed Radiators are difficult to control by Hand!





Above: A concealed radiator within the wall shown in "phantom," with Johnson heat control valve.

At left: A cabinet hides the "standing radiator" with Johnson valve on steam supply.

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is particularly desirable for such installations . . . Comfort, Economy, Convenience are the dividends paid by the JOHNSON SYSTEM

Radiators are being installed in less accessible locations than ever before. In schools, clubs, hospitals, homes, offices, and theaters, non-ferrous heating units are concealed within the walls. Cast-iron radiators are recessed behind grilles or hidden by cabinets. To operate the radiator valves manually, an unhandy access panel or valve with extended stem and unsightly handle must be provided. Where the Johnson System of Heat Control is installed to control radiators automatically, no such provisions are necessary.

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3. Maintains the room temperature at seventy degrees Fahrenheit (*) when outside weather conditions are such that heat is required.

*Or any other desired temperature.

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The Trane Air-o-lizer System combines in one unit, the heating system, the ventilating system, and the temperature control system. The Trane Company is the only company that manufactures the complete unit. The Trane Company takes the responsibility for the entire installation and gives you a guarantee with teeth in it.

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Send for the evidence

It is the duty of every school board member to be informed on the latest and most economical methods of heating, ventilating and temperature control. The Trane Company has prepared a descriptive circular on these subjects, which will gladly be sent to any school official on receipt of the coupon.

THE TRANE COMPANY
Department 1, 309 Cameron Avenue, La Crosse, Wisconsin

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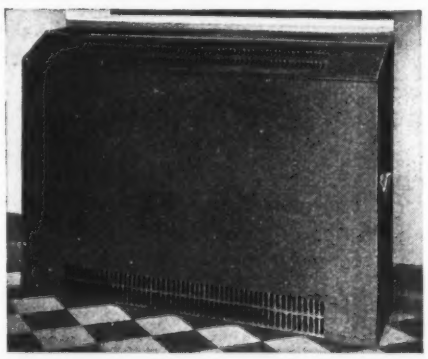

"The Trane Company guarantees that its Air-o-lizer System, when installed according to instructions and when supplied with sufficient steam, will furnish the required amount of outside air to each room at a sufficient temperature so as not to cause drafts, and will regulate the flow of steam to said air so that at all times no overheating shall result therefrom, and so that the temperature of the air at the bulb of the control valve used for heating will be maintained within two degrees plus or minus of the set temperature."

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Which gives complete technical data about The Trane Air-o-lizer

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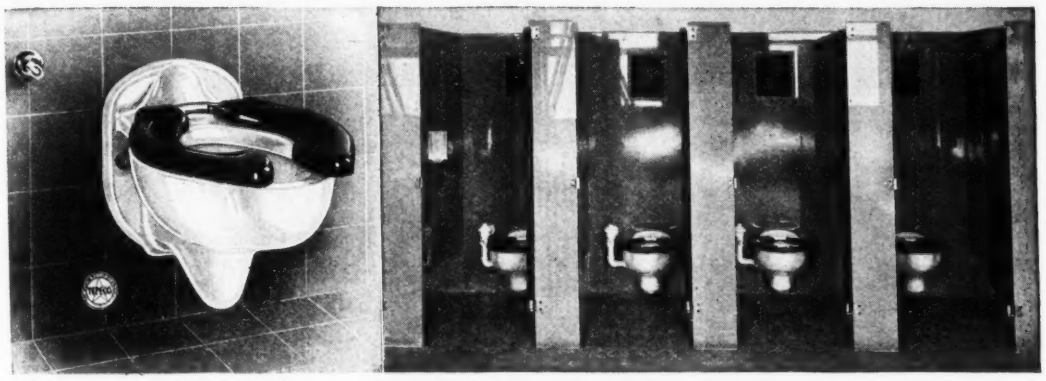
TRANE AIR-O-LIZER



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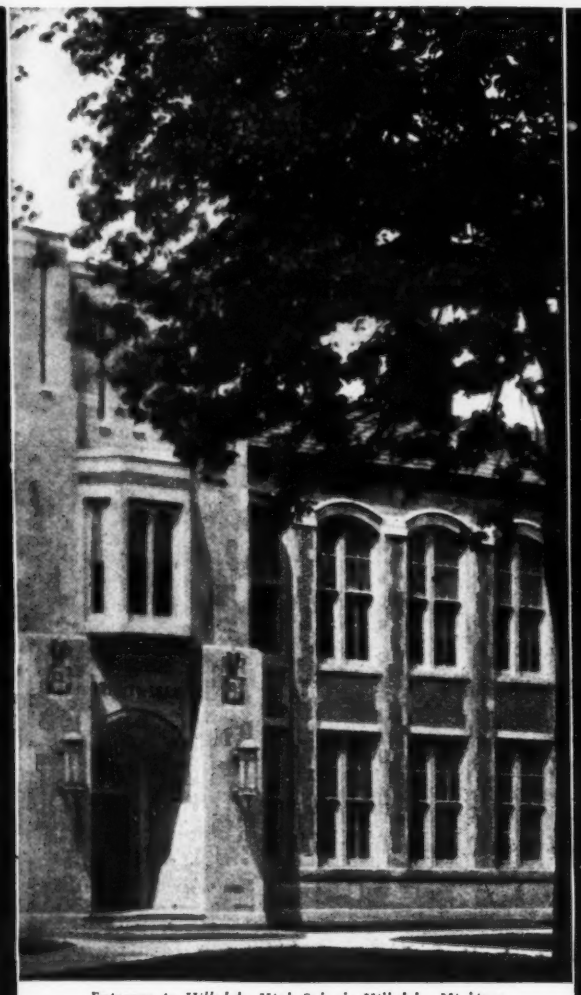

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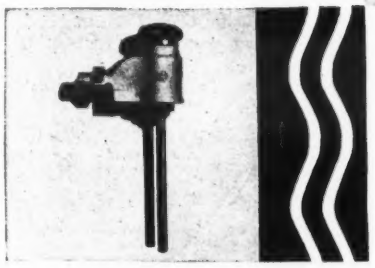
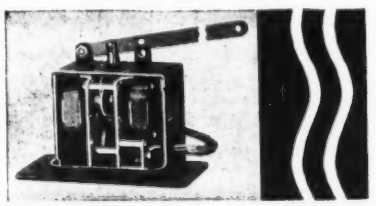


The Modustat



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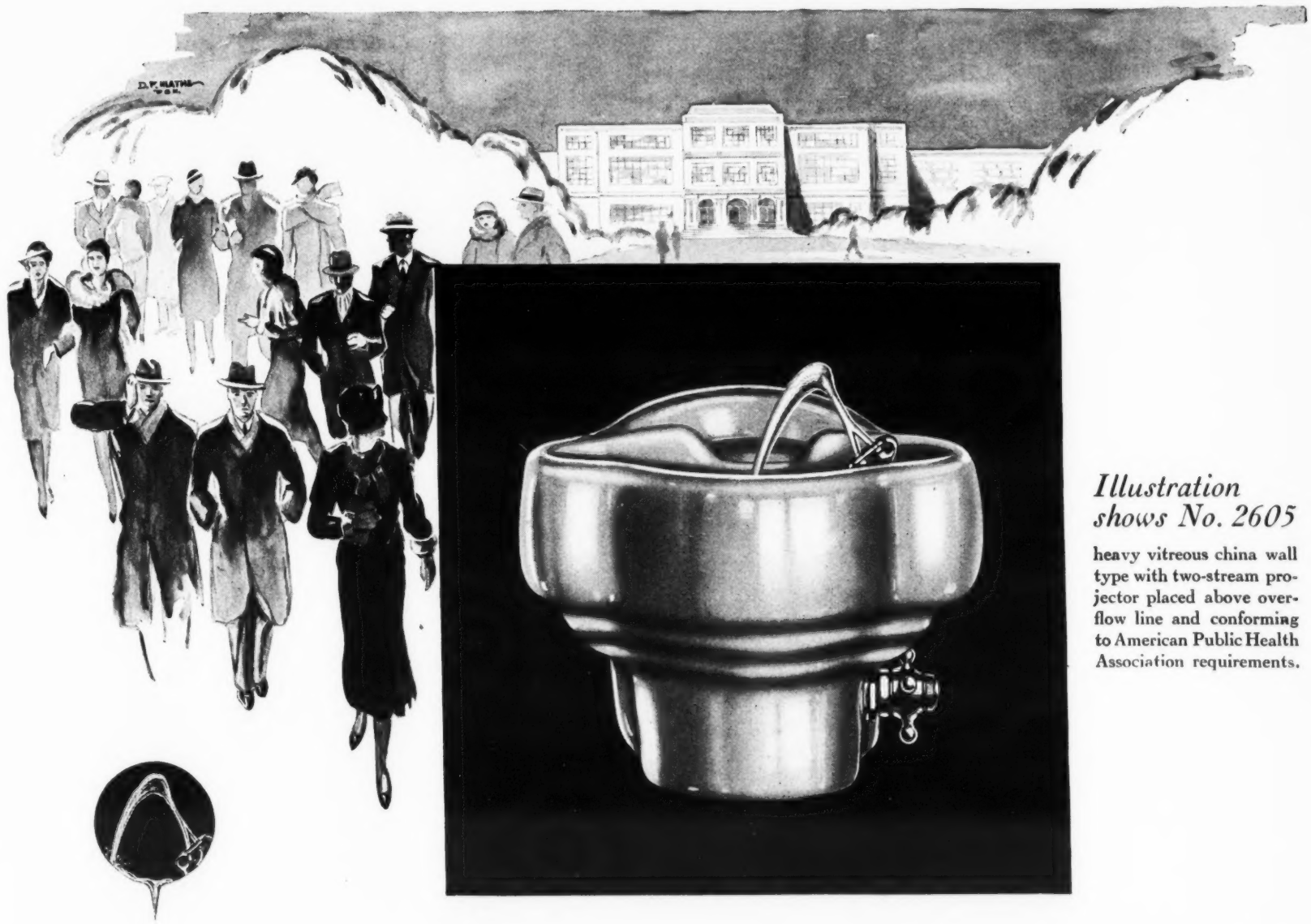

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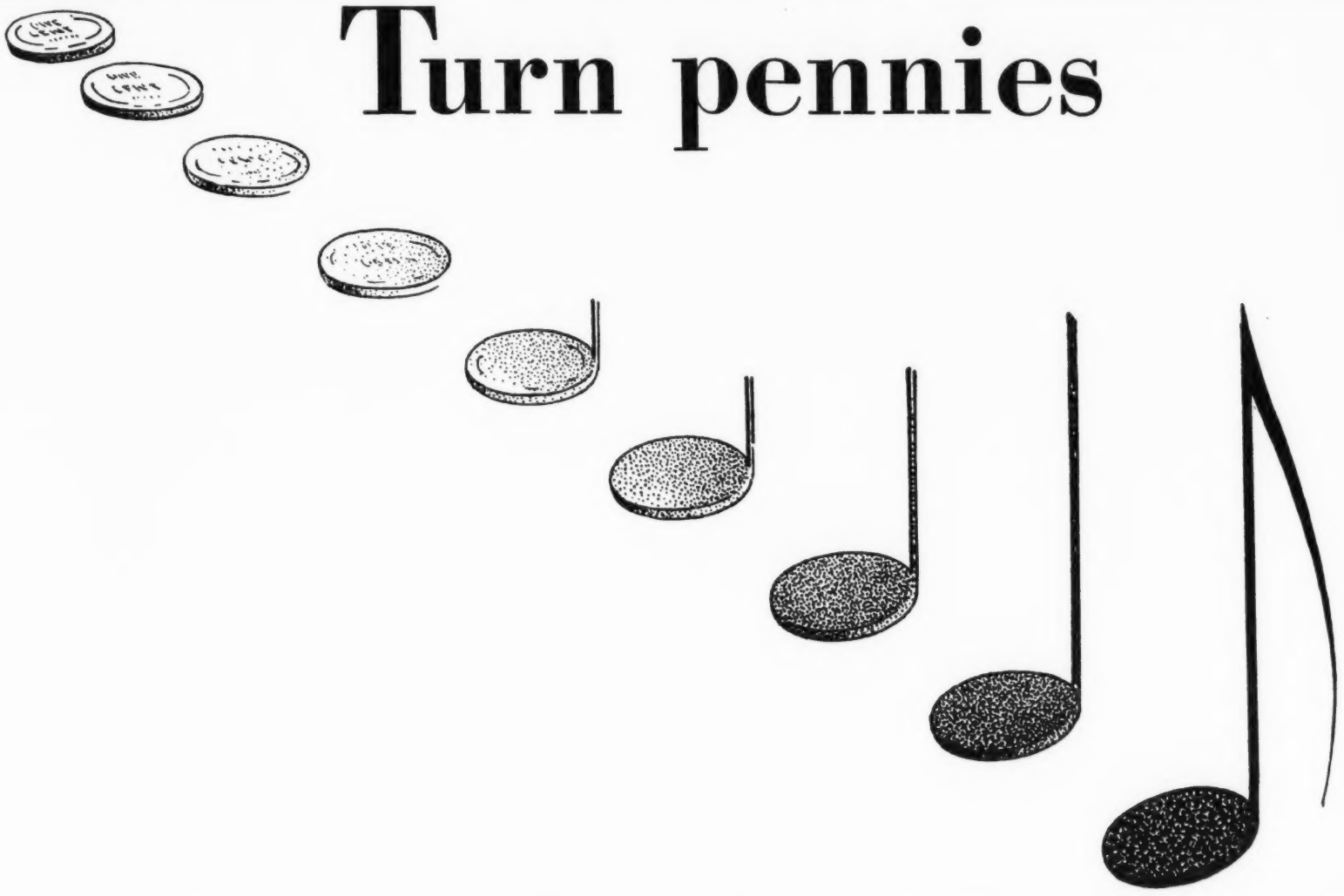

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Backward—March!

¶ Once upon a time a man under the influence of fire-fluid was found walking backwards. Upon being questioned as to his strange locomotion, he replied that he was not as much concerned with where he was going as where he had been.

¶ There is a mighty army so marching today. They are marching under a banner of misplaced economy and misguided retrenchment.

¶ They are those who would accommodate the pupils in out-of-date seatings which cramp their comfort and gamble with their health.

¶ They are those who would deprive pupils of adequate supplies for creative learning, the entire elimination of which would not make a dent in the taxpayers' bill.

¶ They are those who would have History, Geography and allied subjects taught without the motivating aids of History and Geography equipment—the tools that cultivate interest and enthusiasm for the subjects.

¶ They are those who would eliminate all of the cultural subjects and concentrate on the three R's, depriving the pupils of those things which develop poise, personality and the power of self-expression.

¶ They are those who would eliminate extra curricula activities and leave the child a prey to and at the mercy of enforced leisure—no agencies for play.

¶ They are those who still have text books, as cited recently, from which the pupil read, "The communications of the world will be greatly improved when the great Panama Canal is completed."

¶ They are those who fail to meet the diversity of interests through vocational training of those driven back to school by unemployment.

¶ They are those who neglect the rural school child through failure to provide the same safeguards for health, the same physical comforts and the same standards of instruction as are accorded the city child.

¶ They are those who in authority refuse to add any new items to their recommended purchase lists on the theory that under existing conditions nothing new in educational appliances should be purchased. Better stick to the old lists even though some of the items are archaic.

¶ They are those who would shoulder all the retrenchment in expenditures on the schools because, based upon past history, they will offer the least resistance.

Forward—March!

¶ France's educational efforts did not retreat with its armies during the dark days of the World War.

¶ American educational leadership is just as brave, just as resourceful, just as courageous.

¶ They are those who are not permitting their school requirements to pyramid.

¶ They are those who are now planning to replace outdated equipment and thus modernize their schools without the compliment of a new building program.

¶ They are those who sense a greater need for instruments of creative learning because of the heavier teaching load.

¶ They are those who recognize the motivating helps in teaching and are utilizing them in an increasing degree.

¶ They are those who feel that the present brings greater demands for cultural subjects and wider provision for an unwelcome degree of leisure.

¶ They are those who insist upon modernization and adequacy, whether of text books, supplies or equipment, and are ever alert for the new lines that will afford more accurate data and more abundant teaching.

¶ They are those who refuse to retreat, who recognize a greater need for normal instructional conditions because of abnormal times.

¶ They are the ones who have caught the spirit of Slocum, the young Standard Bearer who carried the flag out far beyond the Confederate lines during the charge at Shiloh. Who, when General Pickett's Aide-de-camp ordered him to return to the lines, through the din of battle called to bring the regiment up to the flag.

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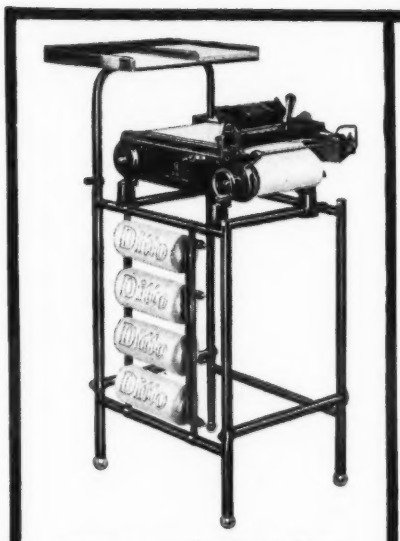

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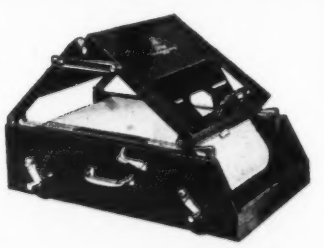

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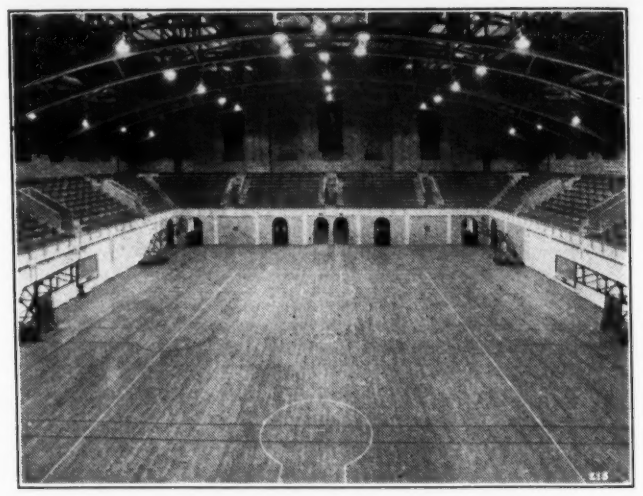

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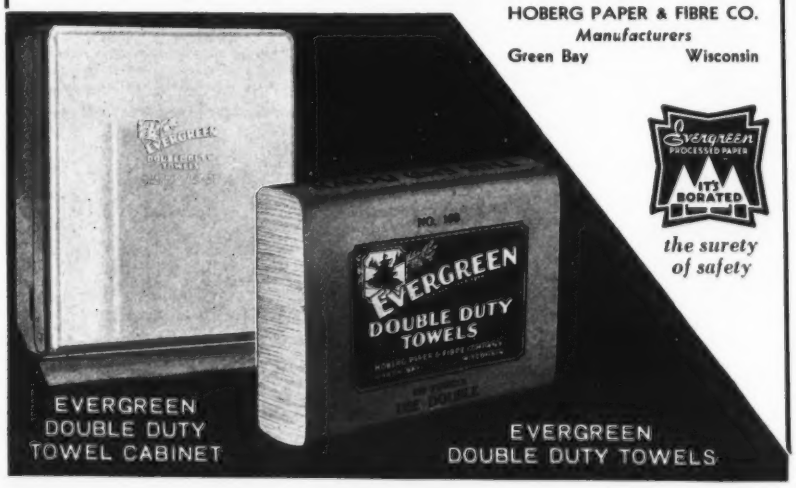

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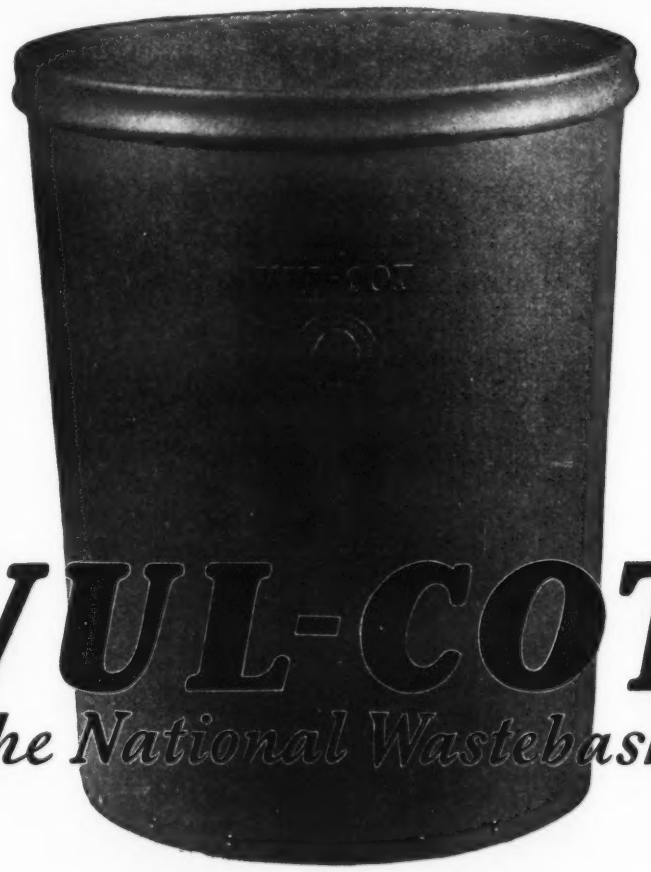

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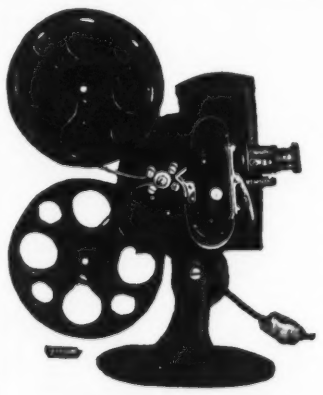

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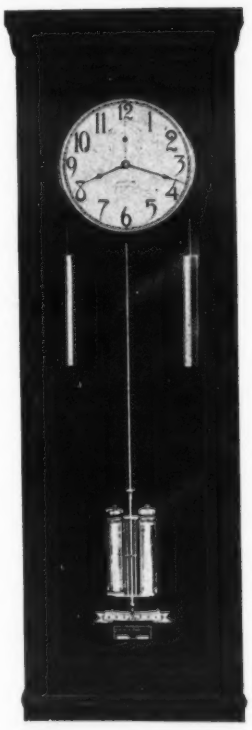

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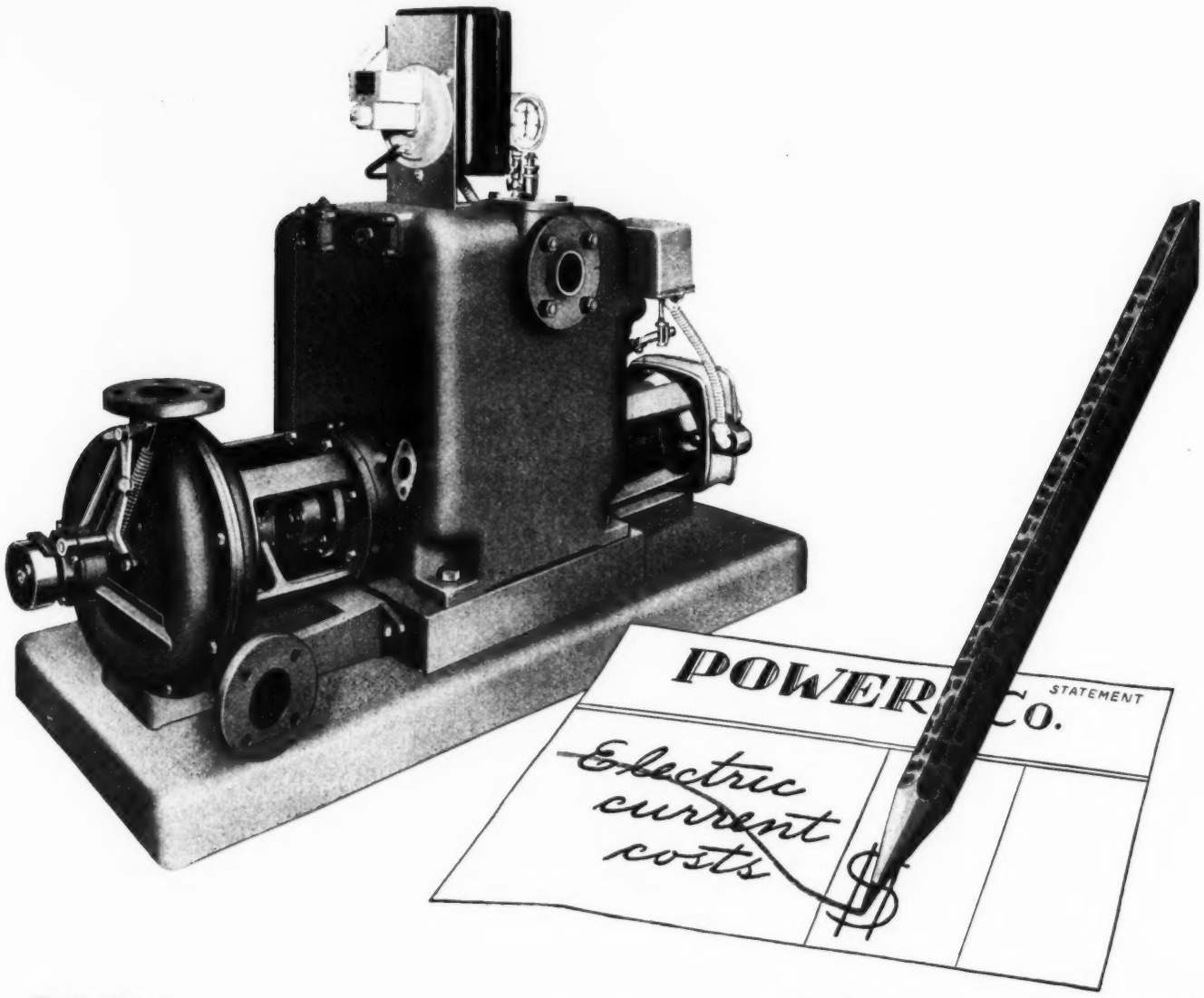

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There are other points about this pump that it will pay you to investigate. They are covered in Bulletin 203. We need only your name and address to send you a copy.

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VOL. 86
No. 1

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JANUARY,
1933

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What of the Year 1933?

THE PROCESS of economic adjustment which has engaged the attention of every governmental unit throughout the United States has not spared the school field. In some instances the financial storm lashed against the nation's bulwark, the public schools, with relentless and distressing force. These instances were in spots which dotted the school field here and there, and which were not altogether general. In the greater number of school units throughout the country, the adjustments were made without impairment to the high standards which had been established.

But what about the future? What is in store for the school interests in 1933? A calm and judicious outlook would readily tell that the worst is past and that the sky shows rifts of brightness and hope. The adjustment of school costs to the general changed conditions in the economic world is well in hand. A more confident spirit has been created and will grow.

The experience of the past year has established the fact that the public is deeply concerned about the integrity and standing of the schools. *It has stood by the schools.*

In brief, the schools will continue to win the support of the public and will be conducted upon a basis of efficiency and service. There will be a comfortable seat for every child, a competent teacher, good textbooks, and sufficient supplies in every classroom. The outlook is bright!

THE PUBLISHER

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Editorial Material—Manuscripts and photographs bearing on school administration, superintendence, school architecture, and related topics are solicited, and will be paid for upon publication. Contributions should be mailed to Milwaukee direct, and should be accompanied by stamps for return, if unavailable. Open letters to the editor must in all cases contain the name and address of the writer, not necessarily for publication, but as evidence of good faith.

The contents of this issue are listed in the *Education Index*. Member, Audit Bureau of Circulation and Associated Business Papers.

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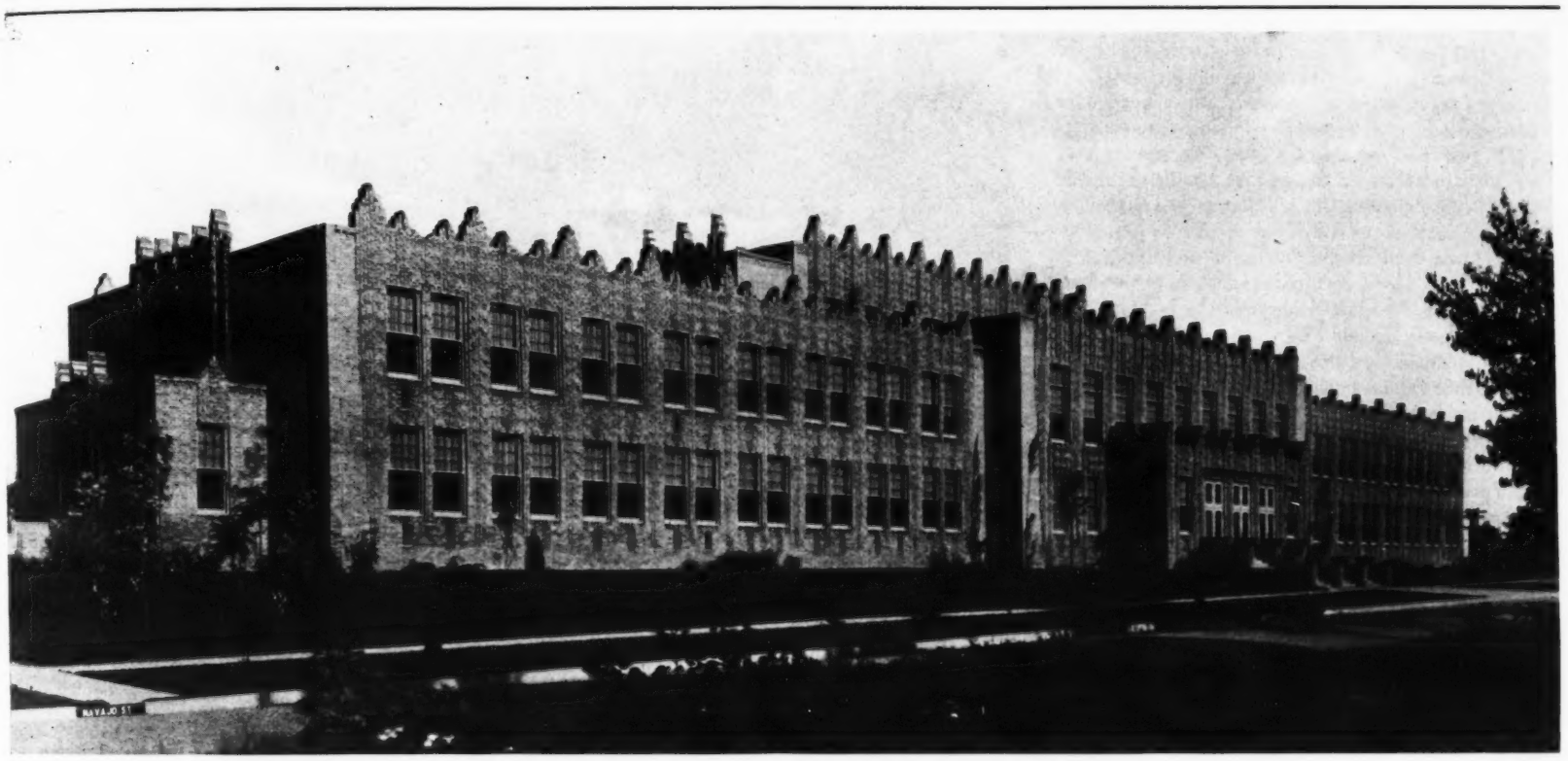

THE HORACE MANN JUNIOR HIGH SCHOOL, DENVER, COLORADO
T. H. Buell and Company, Architects, Denver, Colorado.
This building reflects in style, plan, and construction the newer tendencies of efficiency and economy in school planning and construction.

School Surveys and School-Board Planning

Frank H. Wood, Educational Consultant, New York City

One of the most significant developments of recent years in school management and administration has been the initiation of intensive inspections or school surveys and the development and furtherance of constructive policies and programs by experts working in coöperation and collaboration with local school officials. The findings resulting from such surveys serve as a check-up on the results of present policies and procedures and as a guide by which to shape and direct future action.

The extent to which this practice has been adopted and the standing of the districts and municipalities that have employed it, are evidence of its value. More convincing still is the satisfaction that has been manifested by the communities that have tried it out and the results that have followed an intelligent, systematic application of the findings.

Education is a big business. The expenditure for it is large — more than for any other civic interest. The nature of the output makes it of transcendent importance. If enterprises purely commercial in character need periodic inventories, a school system assuredly is of sufficient concern and moment not only to deserve but to demand it.

However desirable it may be at other times, there is urgent need of it when far-reaching changes or unusual expenditures are either called for or contemplated. Such occasion may be the adoption of a new plan of organization, the redistricting of schools, the selection of new sites, the construction of new buildings, or the formulation of a long-distance plan for future development as an essential basis and guide for wise and effective present-day procedure.

When a problem of new construction is in the foreground, it is a peculiarly fitting and favorable time for such an inventory. It is at this juncture that surveys and preliminary planning are increasingly prevalent. It is then and there that the chief questions relating to school economy and school administration naturally converge and center. It is the psychological time and place to take reckoning of the past, to scrutinize means, modes and methods, and to weigh results.

Economy and Satisfaction from Intelligent Planning

With these findings as a guide, the way is open to plan intelligently for the future, to make out a prospectus or summary of the course to be followed and the policies to be adopted. It will then be possible to make a prescription for the proposed new building that will serve the precise needs and demands of the school, a building so designed as to function most advantageously, economically, and effectively in meeting not only present-day practices and standards but also such changes and alterations in them as the future is apt to require. It is essential that plans be so elaborated and perfected that the new structure will adapt itself readily to any changes or modifications in organization and administration, or to any degree of expansion that the probable growth and development of the system may require.

The fact should be stressed that by determining the needs with utmost care and by the formulation of a definite, detailed plan for the most effective way and manner of meeting them, substantial economies can be effected and much more usable, satisfactory, and serviceable buildings can be designed — buildings for which no apologies will be necessary when a coming generation is completing the payment of the bonds. Not infrequently are the savings effected by this procedure sufficient to meet the entire cost of the survey, the prescription, and the plans of the architect based on them.

This process requires a liberal use of time, study, and reflection. It calls for frequent conferences and consultation with local officials. The final report should be the outgrowth of repeated correction, emendation, and revision. Yet notwithstanding all this, it has long been my conviction that expenditure for this service as commonly practiced could be materially reduced through a freer use of available local aid. For reasons to which I shall presently revert, liberal coöperation of local officials should be sought as an end in itself. In any event, the work is of such moment that no reasonable effort should be spared to do it so ably and accurately that the findings will be free from all avoidable errors and that the conclusions will be sound and well founded.

Major Results of Building Survey

At least three major results should follow any well-conducted building survey: first, a school building that will serve to reasonable perfection the functions for which it was erected and minister advantageously to the precise and distinctive needs of the district; second, a plan that will produce a pleasing, attractive, sanitary building at minimum expense; third, a structure so designed and so equipped as to keep maintenance costs reduced to lowest terms.

We have dwelt thus at length on the building phase of survey and planning by reason of its importance *per se* and because so many other school interests are involved in it and affected by it. However, the point needs to be strongly stressed that a thorough accounting should be frequently and regularly made when no construction is needed or anticipated. School as well as business inventories should be taken periodically and for similar reasons, viz., to ascertain the precise condition of the business, the gains, the losses, the prospective outlook, how new plans and policies are functioning, what changes and modifications in existing procedure can be adopted with profit, and, in general, to discover if any additional expedients or any new phase of strategy should be employed to carry established policies and practices into more effective use. The fact should be recognized that the purpose of a survey is to justify existing policies of administration and methods of procedure as well as to inaugurate new policies or to change, modify, or extend present ones.

If the original survey is thoroughly and intelligently conducted and the findings put into clear, workable form for practical use, subsequent surveys will be much simpler and easier. They can be readily and effectively carried out by the local school officials with little or no assistance from a specialist, particularly if there has been close and full coöperation in the original survey as we have already advocated.

Helpful Incentives

At the outset we said the school survey is a recent development of educational practice to commend itself to popular favor. But although it has taken firm root and has amply justified itself, the practice, while frequent, has not yet become common or general. There are influences at work, however, that must inevitably quicken its spread and hasten its development. The following seem worthy of mention:

1. The influence of the scientific method in application to school problems, of precision and accuracy in direction and management, of thoroughness and efficiency in performance and operation.

2. The demand of the hour for economies which can be properly effected only by securing maximum returns for necessary expenditures.

3. An aroused public interest. The great increase in school costs during the decade tends to elicit an insistent and persistent call for an accounting of expenditures both those that have been made and those of unusual character that are contemplated. The public is coming to be interested in the workings of the school plant as well as in the character of the output. It is coming to ask questions about organization and methods of operation as well as about results and costs.

4. To an increasing measure, school boards are recognizing the importance of taking those who pay the costs more fully into their confidence and are finding that an accurate, convincing presentation of all essential facts and figures and a definite record of accomplishments is the surest if not the only method of obviating criticism and disarming the critic.

5. To an increasing degree, boards of education are forming the habit of introspection. They are asking themselves, Is our system as a whole good or bad? Is the organization faulty and defective or sound and flawless? Is the system well or poorly administered? Are circumspection and economy practiced to a commendable degree? Are there leaks, ill adjustments, friction, waste motion, or other losses anywhere that need to be overcome?

THE ESSEX COUNTY BOYS' VOCATIONAL SCHOOL, BLOOMFIELD, NEW JERSEY
Guilbert and Betelle, Architects, Newark, New Jersey.
This modern building is an interesting example of the newest type of building in which modern design is combined with great flexibility and economy of plan and permanency of construction.

Retarding Influences

It may be well to consider here some influences that tend to retard attempts to assemble information and to collect data on which to base a scientific course of procedure such as we have endeavored to point out:

1. The handicap of tradition. This is often too strong to be readily overcome. Adherence to past practice in many communities seems to be well-nigh a fetish.

2. The tendency to passivity or inertia is another hindrance. School boards are composed of those who are necessarily engrossed with the duties and cares of their individual vocations. The time and thought they give to school affairs is often at the sacrifice of personal interests. At their stated meetings, the regular routine of work together with incidental items that press for attention commonly leaves no time or inclination for unusual and extraordinary endeavors, especially in new and untried fields. Hence there is a natural inclination to keep to the beaten path as a matter of convenience.

3. Satisfaction with the home-school system as it is. How many communities are there that do not regard their schools the best or at least the equal of any? They hear its praises continually, see their children go from grade to grade and graduate in increasing number and at a young age. They have confidence in those whom they have selected to direct and manage school affairs and are commonly entirely out of touch with other school systems. School boards naturally are inclined to look with favor upon their home school whose work they direct and for which they are responsible. They are likely to have only the schools of their youth in mind for comparison. If without definite data or standards for accurate estimates and comparisons, they are inclined to base their conclusions on the favorable reports of those connected with the school system.

I am reminded of the case of a principal who made free use of the local press to advertise the home school. A favorite plan was to make comparisons with neighboring schools. As in rival business exhibits, his school always headed the list in the particular feature that was stressed. At length the heads of the neighboring schools in self-defense resorted to the practice, with results that brought discomfiture to the principal who initiated it. The school board, horrified to find the primacy of its school lost, promptly sought a new principal to put the school again at the head of the list.

School-Board Leadership

Teachers naturally and properly think well of the results of their daily planning and labor, of the drama in which they are the chief actors, of the organization to which they owe employment. One would expect their reports to take on a golden glow.

Children are instinctively loyal to their teachers and their school. One of the most interesting and significant experiences in educational work is the implicit trust and confidence of the average child in his teacher. In this way, through the eyes and the heart of the child the reputation of the school reaches the home in the most effective manner. Thus is the circle of influence which tends to make a community satisfied with its school made complete.

To whom should a community look for a true, faithful, unbiased report of its most outstanding and costly activity? Obviously to the board of education to whom is intrusted its direction and management. For their own information and guidance as well as in justice to their constituents, ought not school boards make a thorough survey and report of the entire field with the aid of outside help if this course has not already been adopted and then follow it up with an annual inventory and report in like manner as the directors of business corporations? Ought they not to formulate some approved system of measurements by which they can render from year to year a complete, accurate accounting not only of the purely business phases of school administration but of educational features as well, of all those activities that directly affect and concern the progress and welfare of the child for whom the school exists?

Some Characteristics of a Good Survey Report

1. It bears upon its face a distinct individuality. It is an accurate clear-cut picture of the particular system under consideration, not a modified picture of some other system. It does not stand out from other reports only or mainly in the opening description of scenery and a different set of names and figures.

2. It shows no evidence of a predisposition to voice personal views or opinions. Its purpose is not to advance some special method of instruction, some particular type of school organization or some pet theory of procedure. Its object is to present facts, not to exploit hobbies or to impose personal theories. Methods and theories are subject to constant change. Facts endure.

(Continued on Page 77)

Standards for Junior-High-School Buildings

T. C. Holy and W. E. Arnold, Bureau of Educational Research, Ohio State University

The development of the junior high school has been the important change in school organization of the past two decades. In 1922 the U. S. Bureau of Education received reports from 387 separately organized junior high schools, with 8,105 teachers and an enrollment of 206,158. In 1928, reports were received from 1,403 such schools, with 31,939 teachers and 839,388 pupils. Also during this same period the junior-senior organizations reporting increased from 1,088 to 2,429 in number and had in 1928 an enrollment of 741,941.[1]

The rapid development of this new unit in public-school organization has brought with it many problems, an important one of which has been that of suitable housing and equipment facilities for the junior-high-school program. Without the benefit of previous experience, boards of education and school executives have been forced to experiment in the building and equipping of junior-high-school plants. Out of many such experiments of the past few years has come much valuable experience.[2] The results of these experiences have not, however, been gathered together and made available to school systems contemplating the establishing of junior high schools.

The writers have among their responsibilities that of serving in an advisory capacity to Ohio school boards concerned with school-building problems. In giving advice on the planning and construction of buildings they have frequently realized the advantages to be gained by supplementing their own knowledge and experiences with the experiences of others engaged in the work of planning school buildings. In order to gather together the experiences of many specialists in the field, the writers undertook to secure a consensus of judgment upon tentative standards for junior-high-school buildings.

The first step was to study carefully a group of junior-high-school buildings, which varied in capacity from a few hundred to about two thousand. Many junior-high-school principals, supervisors, teachers, engineers, janitors, and other employees were interviewed as to the various features of building and equipment. The next step was to search carefully the published literature concerning all features of the junior-high-school plant. More than five hundred books and articles were examined and abstracts made of those which were sufficiently definite and reliable. Using all the material gathered in these ways, tentative standards were written and mimeographed. Copies were then sent to the members of the National Council on Schoolhouse Construction, composed of 36 school-building specialists connected with state departments of education, ten directors of school buildings in cities, six school architects, nine specialists in school buildings connected with universities, and one editor of an educational journal. Copies were also sent to a group of prominent school architects not members of the council. These school-building specialists were asked to read the material carefully and to make any suggestions or criticisms which they thought necessary.

The tentative standards were read and criticisms and suggestions received from 11 specialists connected with state departments of education, five directors of school buildings in cities, eight school architects, five specialists connected with universities, one editor of an educational journal, and one school-building consultant.

The suggestions and criticisms received were carefully analyzed and where the consensus of opinion was for or against an item, this item was changed in accordance. The result is a set of standards representing not the opinion of a single individual but a consensus of the experiences of many competent experts. It is, of course, not to be assumed that every person agrees entirely upon the statements concerning every individual item of the standards, but it is believed that the statements concerning each item more nearly represent the views of the entire group of experts than would any other statement.

Editor's Note—This is the first part of an important series of articles discussing the fundamental principles of planning and constructing buildings for use by the junior high school. To broad scientific study of the problems involved, the authors have brought many years of practical experience to bear.

Limited space makes it impossible to present here the standards for all of the 105 items as finally written, and therefore only those parts will be given upon which there has been the most discussion or which are of most general interest.

Sites for Junior High Schools

A great many of the factors regarding the site for junior-high-school buildings are generally accepted. For example, it is generally agreed that the junior high school should be located as near the center of the territory it serves as possible, with due regard to such other factors as environment, traffic hazards, and transportation facilities. On other factors, however, there has not been such agreement. It is interesting to note that the consensus of opinion as shown in this study places one and one-half miles as the maximum distance which children should be expected to walk to school. Children living farther from the school should be provided with transportation.

The most desirable size for the site of any particular junior high school will depend upon various factors, such as the size of the school, shape, contour, and location. The consensus of opinion gives five acres as the minimum for small schools with as many as ten acres recommended as desirable. For schools with maximum anticipated enrollments of 1,000 to 2,000 pupils, it seems to be fairly well agreed that a minimum of ten acres should be provided, although as much as fifteen acres is considered more desirable. For schools enrolling more than 2,000, fifteen acres are a minimum.

The best form for the school site is rectangular, with the length not exceeding four times the width. While it is best to place the building on elevated ground, the playground area should be reasonably flat and smooth but properly drained either naturally or by an adequate system of underdrainage.

Two factors must be considered in arranging the grounds — utility and beauty. The building should be placed symmetrically upon the site and should be a sufficient distance from streets to reduce traffic noises as much as possible.

Flexibility

Due to the relative permanence of school buildings and to the changing educational program, it is highly important that a great degree of flexibility be provided in the planning of such buildings. The following recommendation covering this feature received general approval:

Since it is not possible to foresee all the requirements of the future, every school building should be so planned and constructed that changes can be made when necessary in the lengths and arrangement of rooms. A great amount of flexibility is secured through the "unit type" of construction which enables partitions at the ends of rooms to be easily removed or changed. Heat and vent ducts, pipes, electric wires and switches, doors and windows are thus placed in side walls of rooms in units of five, ten or more feet in such a manner as to offer no difficulties in enlarging or reducing the length of any room. Equipment should be installed so as to make changes as easy as possible. Built-in facilities should not be so specialized as to make it difficult to readapt the rooms for other purposes.

Expansibility

Closely allied with flexibility is that of providing for future additions. Failure to provide in the original plans for future additions has been too often the cause of difficulties and waste when unforeseen changes have necessitated expansion.

The building should be so planned that it can be enlarged as needed without unnecessary cost and without cutting off the natural light and ventilation of any existing rooms. Stairways, corridors, administrative rooms, toilets, special rooms, shops, heating plant, sewers, electric feeders, water mains, and in fact the entire building should be planned with a view to possible future additions.

Economy of Plan

In order to secure maximum utilization of space, every possible square foot should serve some useful purpose. In the tentative standards submitted to the group of authorities on schoolhouse planning, the "candle of ratios" established by the Committee on Schoolhouse Planning of the National Education Association was used. This recommended division of space was criticized by many as unfitted for a standard for junior-high-school buildings. In accordance with the suggestions submitted, a new "candle of ratios" for junior-high-school buildings was developed as follows:

Instruction .....not less than 60 per cent
Stairs and corridors ....not over 15 per cent
Administration .....not over 12 per cent
Walls, partitions, and
accessories .....not over 13 per cent

Corridors

The width of corridors will depend on the number of rooms to be served, location of stairways, location of lockers and other varying factors. Needless to say, excessive width of corridors is an unnecessary waste, but on the other hand, corridors which are too narrow are an element of grave danger in case of fire or panic. Narrow corridors create congestion which leads to disciplinary problems and brings about unsatisfactory conditions in the routine management of the school.

Donovan's[3] recommendations on corridor widths were submitted to the group and were generally thought to be excessive. The following revision was made in light of the suggestions received.

Total Number of Rooms on Corridor	*Recommended Width*
8 or less	8′ 0″
9 to 10	9′ 0″
11 to 12	10′ 0″
13 to 14	11′ 0″
15 or more	12′ 0″

The foregoing table applies to corridors flanked by rooms on both sides. Where rooms are on but one side of a corridor, the widths recommended may be reduced by from one to two feet. Where corridor lockers are used, the width of the corridor should be increased one foot.

Corridor Display Cases

Junior-high-school principals and teachers interviewed were without exception decidedly in favor of corridor display cases. Such cases should be built flush with walls and provided with adjustable and removable shelves. Lighting fixtures should be concealed. The front should be of plate glass, protected by means of a rail or grille. Secure locks should be provided.

Academic Classrooms

Academic classrooms should be planned to meet the specific needs of the particular school. It is

[1] *Statistics of Public High Schools, 1927–28.* United States Office of Education, Bulletin No. 35, 1929, p. 2.

[2] Since the completion of this study, N. L. Engelhardt has published an excellent addition to the Strayer-Engelhardt series of school-building standards under the title, *Standards for Junior-High-School Buildings.*

[3] Donovan, John J., *School Architecture* (New York: Macmillan Company, 1921), p. 307.

therefore unwise to recommend a "standard" size for classrooms in general. In some schools it is an advantage to have a few "undersized" and a few "oversized" classrooms. It is a waste of space to have classes of no more than 10 to 15 pupils occupying rooms with a capacity of 35 to 40. Such is often the case in very small schools where classes are not uniform in size. Varying the size of rooms may greatly increase the utilization and does not greatly affect the flexibility of the building when unit-type construction is used.

There are certain essential factors which should be considered in planning all classrooms. Proper natural lighting to all parts of the room is important. This necessitates the rule that the width of the classroom should not be greater than twice the distance from the floor to the top of the windows. The length of the rooms used for recitation purposes should not exceed 30 feet, due to the fact that pupils in the rear of the room will have some difficulty in hearing and seeing the activities in the front of the room.

The area per pupil is dependent upon the method of instruction and the type of furniture used. Where immovable desks are used, the area per pupil should not be less than 15 square feet. Movable furniture, such as tables and chairs, will require somewhat greater area per pupil.

The old rule that the space between windows should not exceed 12 inches was frequently criticized by the group coöperating in this study. As the architectural design of the building frequently necessitates piers between windows, it was suggested by a number of competent authorities that where piers are necessary, 20 to 25 inches might be permitted without injuring the natural lighting of the room.

General approval was given to the following statement concerning floors of academic classrooms: Hard wood is a standard material for the floors of academic classrooms. Boards should be straight-grained and free from all defects. If hard pine is used, the boards should be rift-sawn, and if of oak, quarter-sawn. In buildings of nonfire-resistive construction, all floors should be double and should be insulated with fire-resistive material. Where buildings are of fireproof construction with cement floors, hard wood should be properly laid over the cement in classrooms. Where furniture is not fastened to the floor, battleship linoleum or other good composition material may be laid over the cement. Floors of all kinds should be laid properly by experienced persons.

Blackboards

The amount of blackboard space needed in junior-high-school academic classrooms varies according to the subjects taught and the methods used by the teacher. No more blackboard space should be installed than is actually needed, for good material is expensive and blackboard absorbs a great amount of light.

Blackboards should be placed on the front wall and, where needed, on the side wall of the classroom. For classes using a large amount of blackboard space, the rear wall may also be used, but in no case should blackboards be placed between windows.

In junior high schools, blackboards should be mounted from 32 to 36 inches above the floor. The width from the chalk rail to the top of the board should be 36 inches. The board on the front wall which is used mostly by the teacher may be 42 inches wide.

Bulletin Boards

As in the case of blackboards, the amount of bulletin-board space will depend upon the methods used in the classrooms. It is more frequently the case that too little rather than too much bulletin-board space is provided. A minimum of 20 square feet should be provided in all academic classrooms with additional space where needed. Cork is standard material.

Classroom Furniture

The desks and seats in academic classrooms should be of substantial construction, adjustable and adapted to the needs of the room. Movable furniture may be used but this is a matter which should be determined by the methods used by the teachers and the policy of the school. In some cases, tables and chairs are preferable to desks. However, the equipment of a classroom should be adjusted to the needs of the room rather than teacher and pupils adjusting the method and manner of work to the equipment. The furniture should be so arranged in the classroom that there will be not less than 8 feet of clear space in the front of the room. Aisles at least 30 inches wide should be open along walls. Secondary aisles between rows of seats should be not less than 20 inches. No obstructions should be placed near doors.

Science Laboratories

General science and biology constitute the extent of science courses in the great majority of junior high schools. Such sciences as geography, agriculture and physiology are sometimes provided with special rooms, but as a rule this is not necessary. The special equipment essential to the proper teaching of the subject should be provided but usually regular classrooms with occasional use of the general-science or biology laboratories will suffice.

A classroom for general science must satisfy a wide variety of demands, such as demonstration work, reference reading, class discussion, writing, drawing, group, and individual experimental work. It must also cater somewhat to the special interests of a number of pupils who follow such hobbies as radio, collecting, construction work, photography, chemical experimentation, and repairwork. Such a wide variety of student activity cannot be supervised properly by a teacher without a convenient laboratory. Most of the important features of the room must be installed while the building is in progress of construction.

One room used both for recitation and laboratory purposes is adequate for a general-science unit. In addition, an apparatus room and a darkroom should be provided. The laboratory-recitation room should provide not less than 35 square feet of floor space per pupil and should be well lighted by windows on one side or on side and rear. Windows should be equipped with two sets of shades, one of which should be opaque and arranged so that the room may be darkened when a stereopticon or moving-picture machine is in use. Not less than 4 square feet of blackboard space and 2 square feet of bulletin-board space per pupil should be provided.

The apparatus room should be located adjoining and to the front of the laboratory. This room should be well lighted and equipped with an abundance of shelves, closets, and drawers. A door should lead directly from this room into the front of the laboratory. It should be sufficiently large to serve as both a storeroom and as a room in which the instructor may prepare materials.

Where a darkroom is provided, it should be connected by a door with the apparatus room. This room should be provided with artificial light only. A small amount of storage space, a sink, and running water should be provided. The room should be equipped with a ventilating duct and a motor-driven fan.

Elaborate science tables are not necessary for junior-high-school classes. Tables approximately 30 inches high, 22 inches wide, and 5 to 8 feet long, equipped with drawers with locks, are usually sufficient. While a sink and water, gas, and electric connections may be provided for each table, it will usually be found satisfactory to have these located conveniently on one side of the room. While specially treated acidproof table tops are desirable, they are not essential.

An abundance of built-in storage space should be provided. Special cases for notebooks, microscopes, books, charts, maps and miscellaneous supplies should be provided. An exhibit case is desirable.

Other equipment for junior-high-school science should include stereopticon and screen, workbench and tools, fume hood with fan, switchboard, fire extinguisher, first-aid cabinet, growing bed, and aquarium.

Except in the extreme south, a conservatory is a most valuable part of the science equipment for both biology and general science. It should adjoin the laboratory if possible. Where laboratories are located on the top floor of the building, the conservatory may be located on the roof and connected by stairway leading directly from the science rooms. A more desirable arrangement is to have the conservatory built on the ground and adjoining the science rooms located on the ground floor. The conservatory should be constructed of glass according to "greenhouse" style. A southern or southeastern exposure is best. Provision should be made to heat it not only by radiators connected with the general heating system but a secondary means of heating should be provided to protect the growing plants during vacation periods when the building may not be heated. Water connections and drains should be provided.

Home Economics — Foods Laboratory

After numerous conferences with home-economics supervisors and teachers, the following statements were drawn up and submitted to the group of authorities who approved with practically no exception. Only a small part of the recommendations are given here, but the following items are probably the most important:

Foods Laboratory. The foods laboratory is located preferably on the top floor of the building, well lighted with window area not less than 20 per cent of floor area. Size of room will depend upon type and arrangement of equipment, but 30 square feet of floor area per pupil should be a minimum. The general construction of the room should be as sanitary as possible, avoiding projections, ledges and grooves which catch dust and are difficult to keep clean. Walls should be of smooth, hard plaster, painted with washable paint with a "satinette" enamel finish. The following materials, in order of preference, may be used for floors: composition tile, cork tile, battleship linoleum, and hard wood. An independent ventilating system should be provided. Where the room is located on an upper floor, there should be a dumb-waiter leading down to an outside service entrance. The room should be provided with sufficient plumbing, gas, and electric outlets conveniently arranged.

There are a number of types of equipment frequently found in the foods laboratories of junior high schools. The more common are the unit kitchen, the laboratory desk, and a combination of these.

1. Present practice favors the unit-kitchen arrangement with stock kitchen range, kitchen cabinet, sink with drain board, storage cabinet, worktable and stool. One or more electric refrigerators conveniently located to the kitchen should be provided.

2. The laboratory table, whether used alone or in combination with the unit kitchen, should contain storage space for each pupil for the more frequently used utensils, not less than 5 square feet of table surface per pupil, a two-burner gas or electric stove with oven or a standard stove adjacent, a sink adjoining the table. The table top should be of durable material, heatproof, stain-resisting and easily cleaned. These tables may be arranged to accommodate two pupils. For junior high schools the laboratory table arrangement with one or more unit kitchens in conjunction will usually prove satisfactory and more economical.

The amount and kinds of equipment needed will vary but much of the following will be needed: dish-towel drying closet, filing cases, book and magazine cases, fireless cookers, pressure cookers, small amount of simple chemical apparatus, dish truck, blackboards, bulletin board, electric labor-saving devices, such as toasters, waffle irons, mixers, and water heaters, first-aid cabinet, and simple laundry equipment.

Homemaking Rooms. Except in very large schools an entire housekeeping "apartment" is an excessive expense unless used for other purposes. However, a dining room or several dining alcoves should be provided in all foods laboratories. The dining room should adjoin the cooking laboratory and should be furnished in a homelike manner with chairs, tables, buffet, or serving table, china cabinet, floor rug and decorations. Home lighting fixtures and window curtains add to the general appearance. Good quality dishes, linens and plated silver should be provided. A bedroom, bath, and living room are

(Concluded on Page 64)

Planning a High School During the Period of Depression

George M. Hopkinson, Formerly Architect, Cleveland Board of Education*

Economize in tax spending now by building only for present needs but with the future in mind. A suggested plan for three stages of development.

Building funds raised by taxation during the next few years for school construction will only be expended for the actual school needs at the time the project is commenced, whereas in the past many projects have been started and completed that provided for more than the needs of the particular district, not only at that time but for years in advance.

Particular attention by all concerned will now have to be given to actual present needs but planning must be done with the future in view. It may be found necessary to omit certain desirable and important facilities and substitute therefor certain combination facilities whereby the education of the child will not suffer. It is of great importance to keep in mind the fact that positively nothing should be planned or constructed now that does not properly contemplate and anticipate future requirements so that at the opportune time the project may be further developed to keep step with the advance of educational, scientific, and community needs.

To take care of present needs only and at the same time properly to provide for the future, a great deal more consideration must be given to each school problem than has been given in the past, and we must fully realize that the economic situation has forced a condition upon us which makes it necessary that we change our line of thought to meet the new conditions.

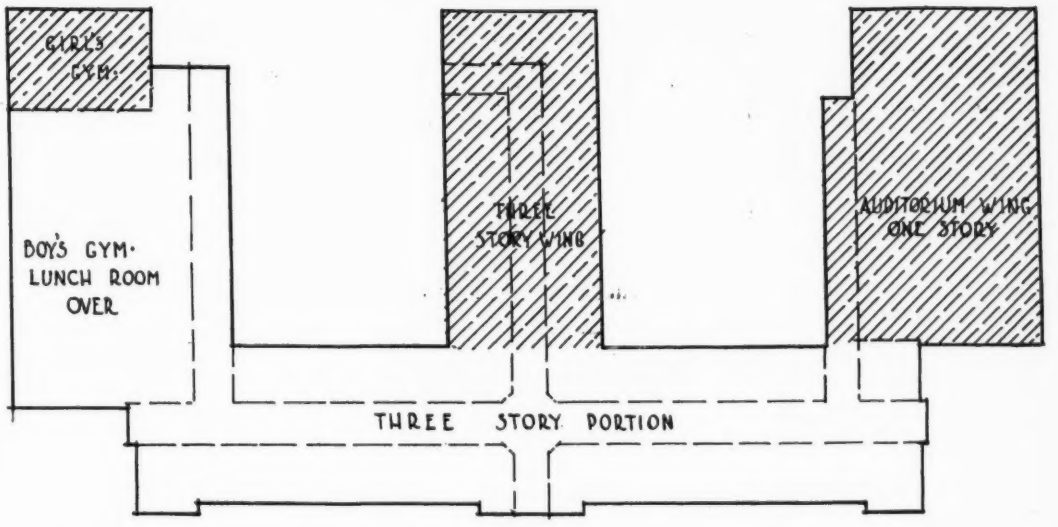

FIG. 2
The second step in the development of the building. The shaded areas are the new additions. Pupil capacity, 1850.

The great question on every hand today is, What can we do without? What can we eliminate? Well, of course, we cannot do without schools; in fact, there is a greater demand for schools than ever. We see all over the country that enrollment is increasing not only due to the greater numbers of children but due to the fact that children prolong their education because they cannot find employment.

The volume of school-building construction during the past two years has been very small, but this only means increased activity in the few years ahead. As proof we have only to reflect on what happened during the two years we were in the war when school building was almost at a standstill, and of the subsequent rush at the close of the war to catch up with the loss in seating facilities occasioned by the delay.

It is true that the tax situation is different today, but seats and facilities must be provided to cover the needs even with the reduced funds, and this makes it necessary to first attack each school layout in its fundamental form.

As an example of a definite problem which embodies the principles noted above, we find in the three diagrams submitted an idea for the commencement of a project and its subsequent development.

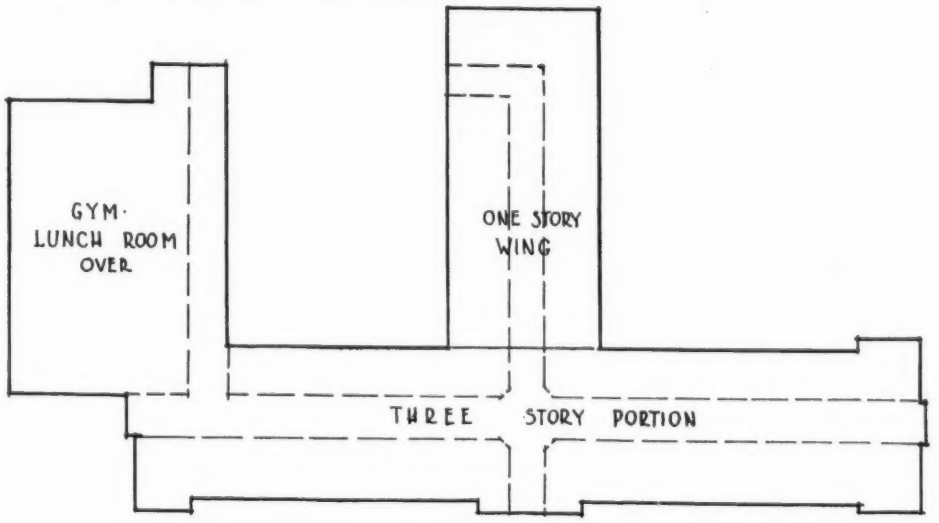

FIG. 1
The first unit of the building to be constructed for a pupil capacity of 1400.

The scheme allows for the following possibilities:

First a building with a minimum of facilities, as shown in Figure 1, to which additions may be made, as shown in Figures 2 and 3, respectively.

If funds are available to provide in the first instance, the facilities shown in Figure 2, then this plan may be used as a base from which to start and later complete, as shown in Figure 3.

Another option is still available whereby a start is made with the scheme shown in Figure 1, and a jump to completion is made in one step to the final scheme of Figure 3, omitting the intermediate step for Figure 2.

To help in visualizing what these schemes mean, an actual example of a high-school layout will be cited giving the educational facilities provided in each plan and thus showing by comparison the extent of the probable future addition. In any problem the same principle can be used making whatever changes are necessary in educational requirements to suit the particular curriculum.

Educational Facilities for Figure 1

The diagram shows the first stage of the project developed for a normal capacity of 1,400 students.

The front portion of the structure is three stories high, and contains the classrooms, laboratories, study halls, library, etc. The center one-story rear wing is known as the shop wing, with the boiler room at the rear end. The end wing contains one gymnasium, used also as the auditorium, over which is built a pupils' lunchroom or cafeteria.

The particular curriculum for this building calls for the following list of educational facilities in this first building unit:

Eighteen classrooms of various sizes, and in addition, one room for each of the following: typewriting, physics laboratory, physics lecture room, chemistry laboratory, chemistry lecture room, biology laboratory, general science and hygiene, woodworking, metal working, printing, mechanical drawing, shop lecture room, domestic science, dramatics and social room, chorus, band, library, lunchroom-study hall, gymnasium, and two rooms for each of the following: sewing rooms, artrooms, and study. This makes a total of 43 educational rooms.

The economy in building this first unit to meet the reduced tax funds is brought about by the omission of the auditorium wing, and by using the large gymnasium as a combination gymnasium and auditorium. One gymnasium only having been provided, it is, of course, necessary to use the same for both boys and girls. Further savings for the time being result in the omission of two upper stories from the rear wing.

The omission of the auditorium from the first unit would seem to be proper if funds are not available at this time. It should be remembered that this lack is supplied by the fact that each educational room in the building is equipped with a radio loud-speaker, and a microphone is located on the desk of the principal. Ample facilities for teaching dramatics are provided for in the room designated as "Dramatics and Social," and this activity does not suffer to any extent due to omission of the large auditorium.

A further economy is practiced in the fact that the lunchroom-study hall, which extends across the entire second floor of the end wing, is partitioned off temporarily to make part of the space a study hall proper. The balance of the space is reserved for combined lunchroom and study purposes with enough tables and chairs to accommodate 340 pupils at each sitting.

Educational Facilities for Figure 2

This diagram shows the second stage of the project developed for a normal capacity of 1,850, or the scheme may be used as a first unit if funds are available.

The educational facilities in this scheme are as follows:

Twenty-four classrooms of various sizes, and in addition, one room for each the following: typewriting, physics laboratory, physics lecture room, chemistry laboratory, chemistry lecture room, biol-

*W. L. Stoddart & G. M. Hopkinson, Associate Architects, New York City.

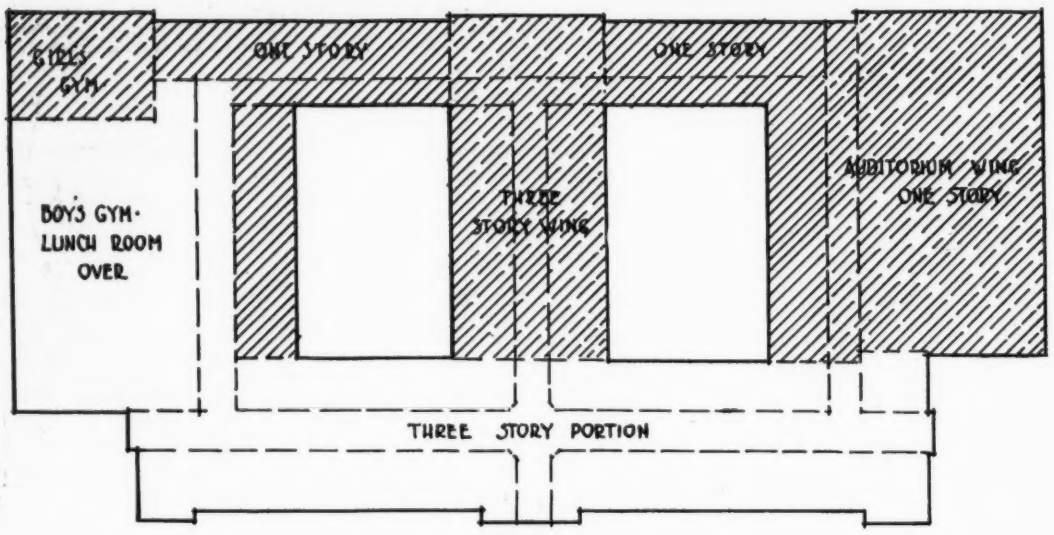

FIG. 3
The building completed for 2500 capacity.

ogy laboratory, bench shop, millroom, metal, printing, mechanical drawing, shop lecture room, dramatics and social room, music and chorus, band, library, lunchroom-study hall, auditorium, also two rooms for each of the following: general science, domestic science, sewing, study halls, gymnasia, and in addition three artrooms, making a total of 55 educational rooms.

To obtain these additional educational facilities it is necessary to add the auditorium wing, build two stories on the present one-story center wing for classrooms, etc., and add the girls' gymnasium at the rear of the large gymnasium.

Educational Facilities for Figure 3

This diagram shows how the additions are added to provide educational facilities for an ultimate capacity of 2,500 pupils. The additional shaded area immediately around the two light courts indicates the necessary one-story additions.

The educational facilities taken care of by the arrangement shown in Figure 3 are as follows:

Thirty-five classrooms of various sizes and in addition, one room for each of the following: physics laboratory, physics lecture room, chemistry laboratory, chemistry lecture room, biology laboratory, biology lecture room, millroom, metal, printing, mechanical drawing, shop lecture room, dramatics and social room, chorus, band, library, lunchroom-study hall, and auditorium, and in addition two rooms for each of the following: typewriting, general science, bench shops, domestic science, and gymnasia, also three rooms for sewing, three rooms for study and four rooms for art. The foregoing make a total of 72 educational units for the completed whole.

In the first scheme the lunchroom-study hall provides for a seating capacity of 340; in the second scheme, for 540; and in the final scheme, for 620 pupils.

The auditorium accommodates 900 pupils, including the seats in the balcony, and the library seats 80, 100, and 130 in the first, second, and third schemes, respectively.

Locker- and shower-room provisions for the gymnasiums are taken care under the bleacher balconies.

In addition to all the rooms mentioned for each stage of development, provision is made for all necessary storage, utility, and auxiliary rooms.

Achieving a Practical Ideal in Rural Schools

The Liberty Corners School, Kenosha County, Wisconsin

The planning and construction of rural school buildings inevitably involves the application of ideals in educational programs, school administration, and building construction and arrangement. The planning and construction of a given school building is invariably a compromise between these ideals and the practical instructional program of the school, and is further modified by the economic limitations of the local school district. A school building in which high ideals have been set up and in which the practical element has been achieved in a notable way is the new Liberty Corners School, in District No. 8, Salem, Kenosha County, Wisconsin. The building was designed by the Wisconsin State Department of Public Instruction, under the personal direction of Mr. H. W. Schmidt, Supervisor of Buildings. It is one of more than 200 rural one- and two-room buildings planned during the past year by the the Department, along original lines. In this building, careful study was made of the present population of the community and its probable growth, of its economic situation, and of the educational program of the school.

The community is a prosperous farming section, in which dairying and truck gardening are steady sources of revenue and are causing a slow but sure increase in population.

The building is of brick-veneer construction, with a solid brick basement, cast-stone trim, and asbestos-shingle roof. The basement, which is 10 ft. 6 in. in height, contains a large room, intended for community gatherings and for play purposes in bad weather. Adjoining the community room is a small kitchen for warming lunches and for preparing meals at evening gatherings. The furnace room contains a first-class heating and ventilating plant, suited for a small school building and of sufficient capacity for a second classroom when the latter is built.

The classroom on the first floor measures 23 by 32 ft., and has adjoining it a library, cloakrooms

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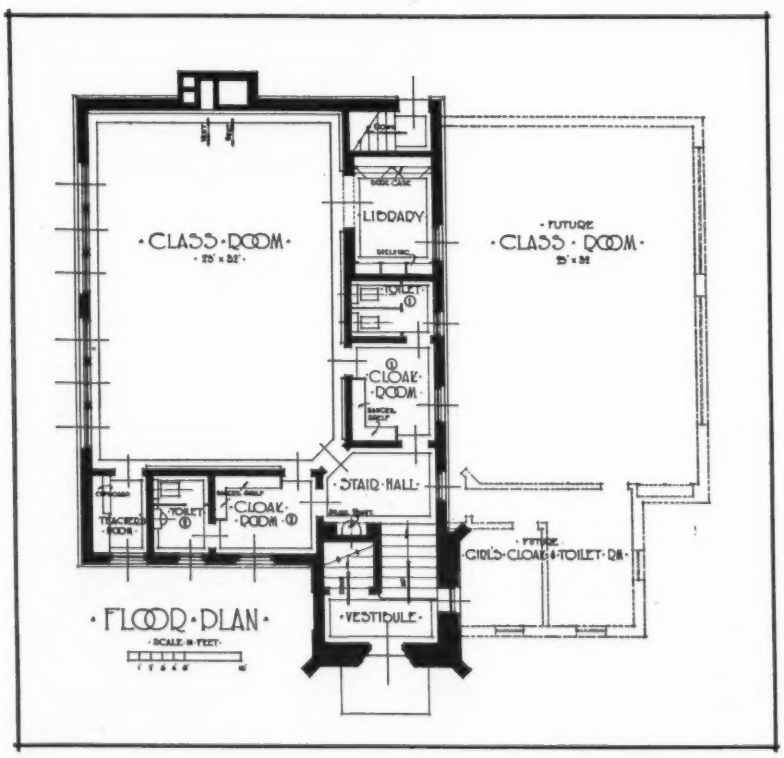
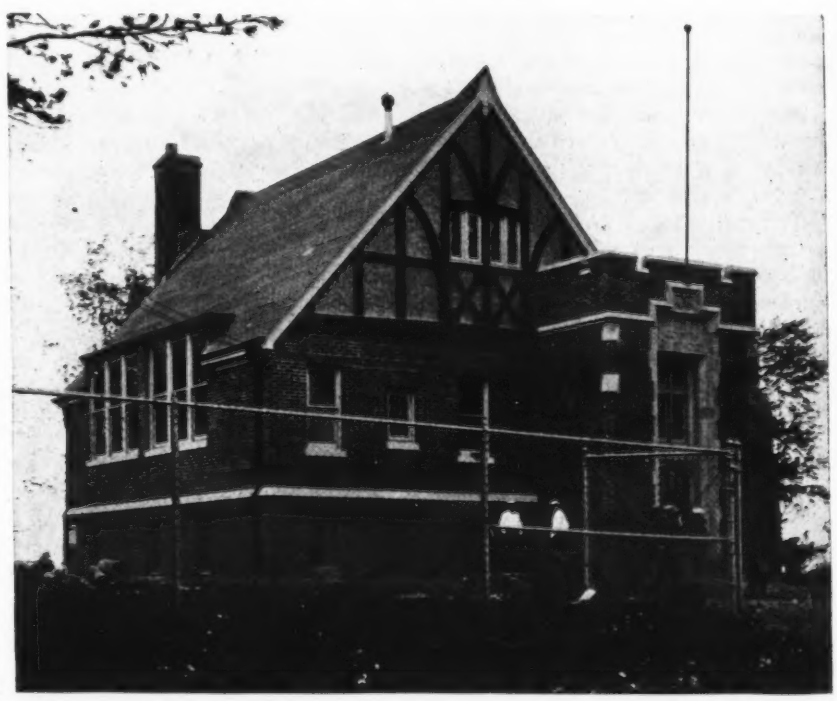
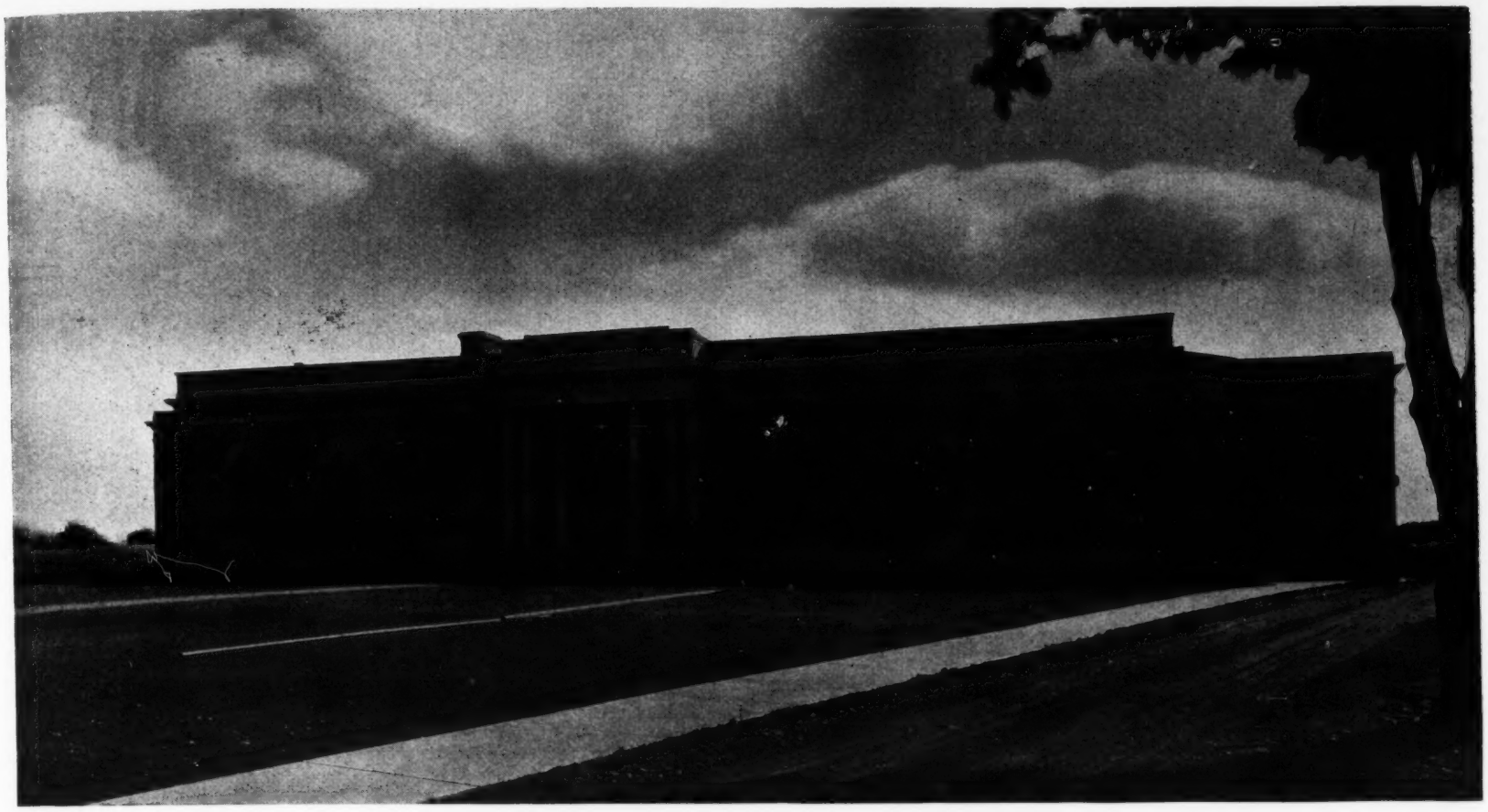




LIBERTY CORNERS SCHOOL, DISTRICT NO. 8, SALEM, KENOSHA COUNTY, WISCONSIN
Designed by the Wisconsin State Department of Public Instruction, under the direction of Mr. H. W. Schmidt, Supervisor of Buildings.



WILLIAMSON CENTRAL SCHOOL, WILLIAMSON, NEW YORK
Carl W. Clark, Architect, Cortland and New York City, New York.
This illustration shows the facade and also one of the four pupils' entrances.

Housing a Complete Village and Rural School

The Williamson Centralized School, Williamson, New York

On the accompanying pages will be found a description and floor plans of the new Centralized School at Williamson, New York. The school serves a centralized district covering an area of approximately 27 square miles of the upper portion of Wayne County, New York. The northern section of the district along the shore of Lake Ontario, is devoted to fruit culture, while the rich muck land of the southern section is suitable for market gardening.

The building, which was completed in September, 1931, is located on a plot of 8.3 acres, in the prosperous village of Williamson which has an intelligent, progressive population numbering about 1,100. All of the pupils residing in the eight outlying districts are conveyed by five busses to the central school. The school has an enrollment of 468 elementary pupils and 181 high-school students and the district served by the school has a population of 2,900.

The building has been erected in three sections. The first section, or east wing, is entirely given over to sixteen classrooms; the second section, or west wing, is devoted to high-school classes; the third part, or connecting section facing the street, is planned to serve community purposes and is arranged in such a manner that it can be readily closed off from the rest of the building for evening use.

The high-school section contains eight class and recitation rooms. In addition, the building provides a full complement of special rooms, a large library, homemaking and mechanical suites with modern equipment to meet the needs, a cafeteria with up-to-date furnishings, convenient administration rooms, and a medical-inspection suite, together with a gymnasium 53 by 92 ft. in size. The auditorium, which serves both school and community purposes, has a seating capacity of 684 persons.

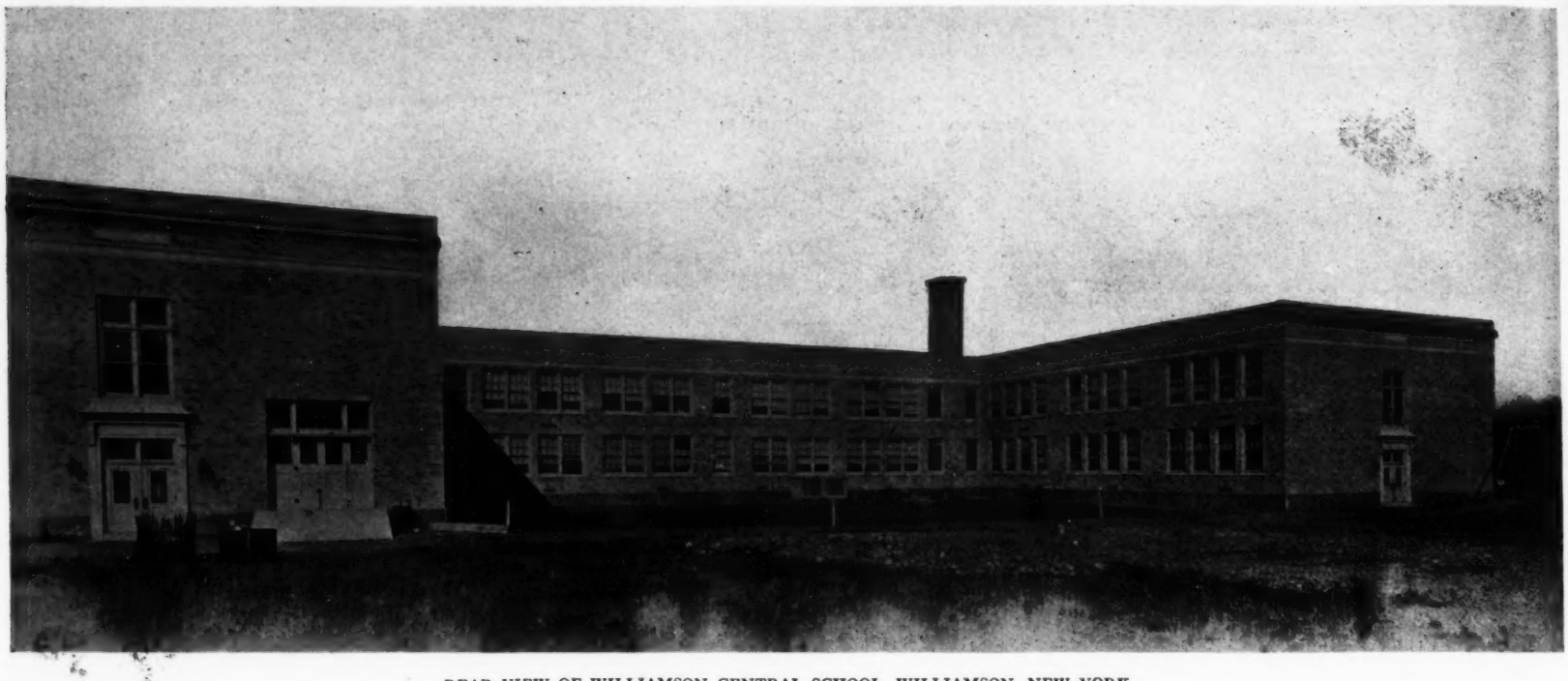
The boiler and service rooms in connection with the heating plant are located in the basement. The heat is supplied by a steam-heating system, with a mechanical system of ventilation of the unit type. Lavatories for boys and girls are located on each floor, together with rooms for storage and supplies.

In the planning of the building, it was the purpose of the architect and the educational authorities to meet not only the needs of the school, but to serve advantageously as a community center for social, civic, and recreational meetings and entertainments, and other uses pertaining to the community. With these facilities, the community has a common meeting place to draw the people together in bonds of common welfare, a place of general assembly for the promotion of the general welfare, facilities which are particularly important in these times when the rural inhabitant is nearer to the schoolhouse than he ever was in former days.

The following extract from a letter of the principal, Mr. Jones, gives his impression of the building as a working plant after more than a year of use:

"The Williamson Central School has occupied its new building, designed by Mr. Carl W. Clark, for

LIBRARY AND REFERENCE STUDY ROOM, WILLIAMSON CENTRAL SCHOOL, WILLIAMSON, NEW YORK
Carl W. Clark, Architect, Cortland and New York City, New York.



REAR VIEW OF WILLIAMSON CENTRAL SCHOOL, WILLIAMSON, NEW YORK

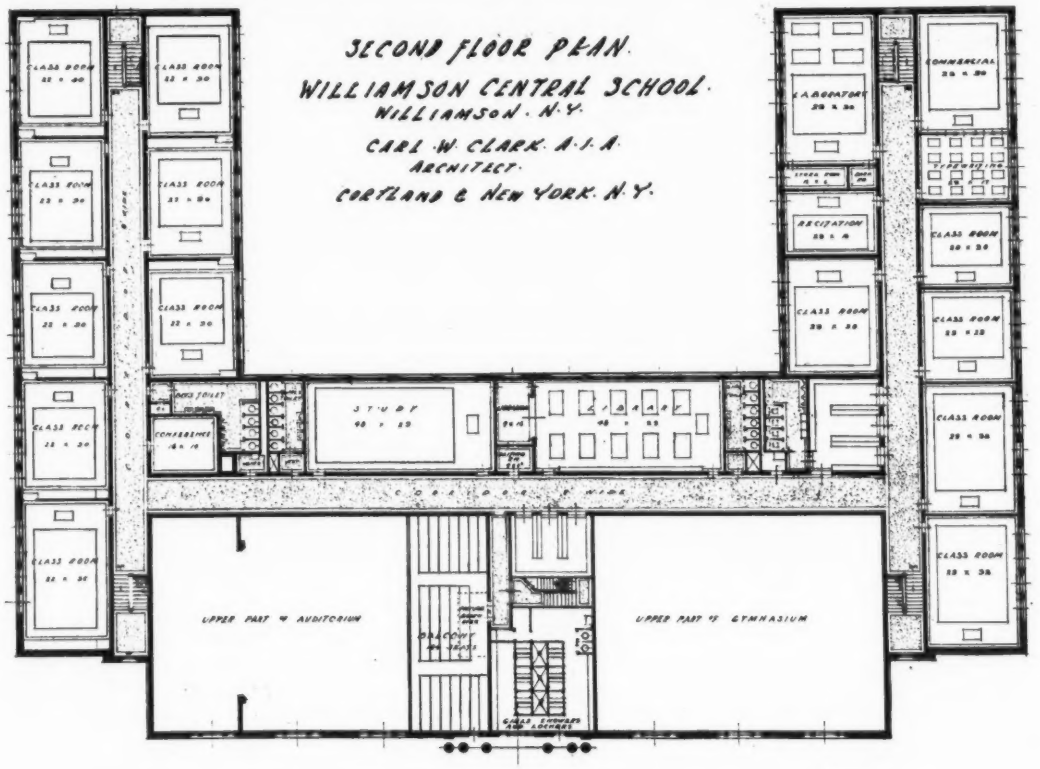
more than a year. As time goes on, we are more than ever pleased with the building — its fine appearance both exterior and interior, the convenient arrangement of the rooms and corridor, the location of the gymnasium and auditorium in the front of the building, and the beauty and durability of the materials used in its construction.

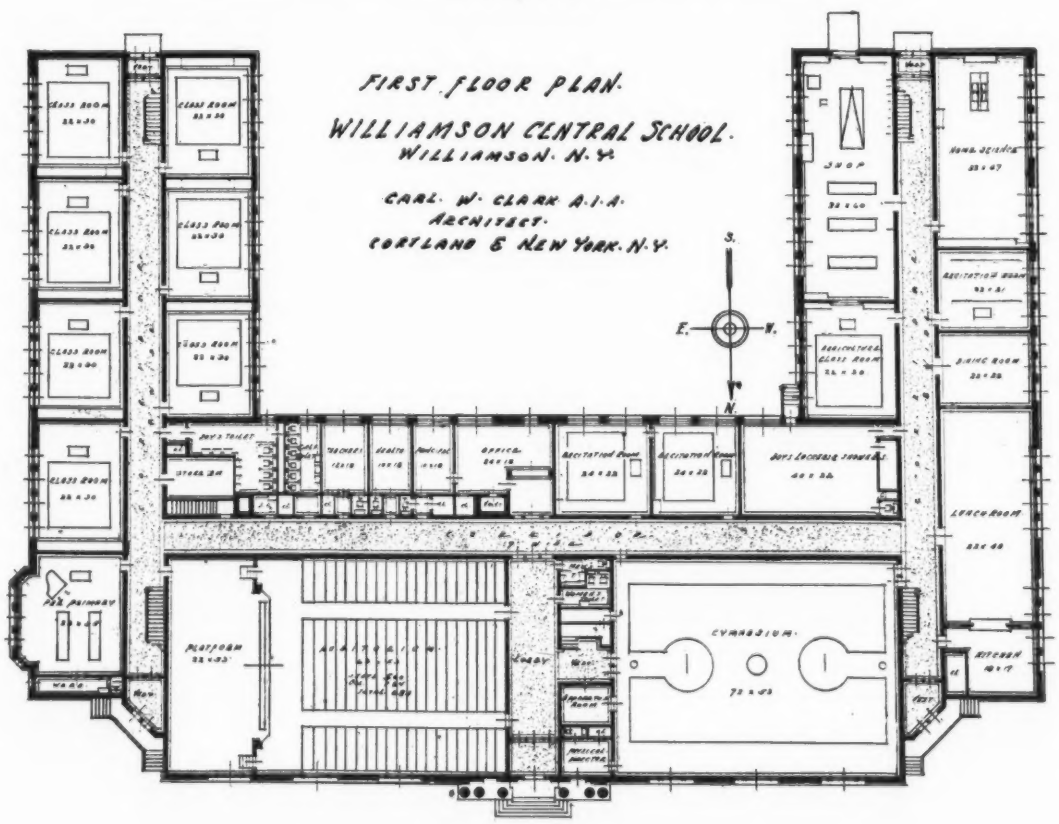
"The auditorium, beautiful in design and equipment, has perfect acoustics and the stage equipment is superb. The gymnasium is one of the best in this section of the state, and the locker rooms are convenient, spacious, and well equipped.

"The cafeteria handles comfortably 400 children daily. A feature is the separate dining room for teachers, giving the faculty a quiet and beautiful room in which to eat.

"The library, an attractive room adjoining the study hall, has splendid equipment. The homemaking department, located in a large room near the cafeteria, has built-in closets and cupboards, giving evidence of the fine care in planning and equipping. The room lacks nothing in the way of equipment for the teaching of sewing and cooking in homemaking classes.

"The heating, ventilation, and lighting of the building have been well provided for. During the past winter it was possible to keep the building warm with the use of one of the two boilers, so that it is easily possible to build an addition and heat it with the present heating plant. There is nothing about the building which could be improved."





RADICAL REFORMS ASKED IN NEW YORK CITY GOVERNMENT TO CUT WASTE

Former Governor Alfred E. Smith, on December 1, outlined before the Hofstadter Legislative Committee a suggested plan for a revision of the New York City government, modeling it after the state government and making the mayor the supreme executive officer over a legislature of two houses, a city senate and a city assembly. The plan was proposed as a means of bringing the city government up-to-date and saving $200,000 a year in city-government expenses.

The simplification of the city administration under the plan would extend far beyond the offices cited, and embrace eleven departments into which all the present functions of the government would be fitted. The proposed departmental organization would include a department of education, to comprise all education, library, museum, and related functions of the city. This department would be in charge of a board of five members, one from each borough. Where the city has *ex officio* members on semipublic education, museum, library, and related board, members of the board of education would be *ex officio* members.

Under education, Mr. Smith would place the present board of education, the board of higher education, the Brooklyn Institute of Arts and Sciences, the Municipal Art Commission, the American Museum of Natural History, the Metropolitan Museum of Art, the Museum of the City of New York, the New York Botanical Gardens, the New York Public Library, the Brooklyn Public Library, the New York Zoölogical Society, the Queens Borough Public Library, the Staten Island Institute of Arts and Sciences, and Grant's Tomb.

State School-Building Service in Missouri

N. E. Viles, Director of School-Building Service, Jefferson, Missouri

An important innovation of the past decade in the service of state school departments is the so-called school-building service. Missouri is the latest state to centralize and improve the school planning and construction service. The present paper outlines the important help which local communities can obtain from a well organized state department.—The Editor.

The State School-Building Service in Missouri was organized soon after the Survey Committee of 1929 made its report to the Legislature. This Survey Committee, under the direction of Drs. George D. Strayer and N. L. Engelhardt, recommended that a School-Building Service Department be established with the following functions:

1. To confer with and advise local school officers who are contemplating the erection of school buildings.
2. Upon invitation of local districts, to conduct building surveys.
3. To check and score plans for new buildings and for alterations of old buildings, and to make recommendations in regard to amending the plans.
4. To develop an appropriate school-building code for the state.
5. To issue frequent bulletins and publications in the furtherance of an educational campaign throughout the state for better schoolhousing conditions.
6. To inspect school buildings for safety and sanitary conditions.
7. To prepare plans for certain types of rural school buildings, such as rural elementary and high schools and furnish the same to the local district free of charge.
8. The division shall set up standard forms of contracts and legal statements and papers required in the process of planning and constructing a school building. These forms should include:
   a) Architect's contract.
   b) Engineer's contract.
   c) Contract for general or special contractors.
   d) Notice to bidders.
   e) Information for bidders.
   f) Affidavit for bidders.
   g) General conditions of contract.
   h) Contractor's requisition for payment.
   i) Architect's certificate of payment.
9. To furnish local authorities the latest figures on costs of various types of buildings and set up a permanent and continuous service of this kind.
10. Advise with local district authorities in regard to the issuance of bonds for capital outlay purposes.[1]

The Legislature of 1931 passed a redistricting bill which provided that many of the small districts in the state may be grouped together into larger units for school purposes. It also provided for free tuition for all high-school students in the state. It is anticipated that these measures will cause the erection of a number of new buildings and that others will be enlarged within the next few years.

Legal Status

Supervision of school-building service is vested in the state superintendent of schools. For years the Missouri laws have given the state superintendent authority to rate and classify schools, and to set up the standards for such rating.[2] One of the factors considered in rating schools is the type of building service rendered. The state gives aid on approved consolidated and village high-school buildings to the extent of one fourth the total cost, provided that no district receive more than $2,000 on any one building.[3] The Legislature of 1931 provided that centralized or enlarged districts may receive building aid to the extent of $1,000 for each rural school abandoned if the children have been transferred to a central building erected according to plans and specifications approved by the state superintendent.[4] These laws give the state superintendent, or through him the state department of education, broad power in directing school-building activities.

The work of the school-building division of the state department of education follows rather closely the recommendations of the survey committee and is done in close coöperation with the School of Education of the University of Missouri. The major aims in this work are:

1. To provide information on school-building service.
2. To make surveys of building needs.
3. To provide building-construction service.
4. To supervise the operation and maintenance of existing buildings.

Informational Service

In order that school officials of the state and architects who plan school buildings may know what the state expects in school-building construction, it seemed advisable to publish a code of school-building standards for the state. An outline of a proposed code was developed by the state department of education. This was checked by the school-building architects of the state, and a meeting of architects and school officials was called to discuss it in detail. Following this meeting a committee of architects was appointed to work with the state department to develop in more detail features that properly belong in the field of the architect and the engineer.

It was not intended to make the code a set of rigid regulations that must govern the details of each building constructed. Many of the recommendations made are suggestive. The few that are mandatory are given special stress. This code is to be published for the schools in the state under the heading of "Approved Practices in School-Building Construction." As now outlined it includes minimum requirements for various types of buildings. These "approved practices" are organized under the following headings:

Site and building location
Construction
Classrooms
Special rooms
Corridors
Stairways and exits
Heating and ventilation
Plumbing
Electric wiring
Equipment
Administrative units

Factors common to elementary, junior and senior high schools are given under general headings. Special features needed for each of these divisions are set apart under separate headings. Sample excerpts taken at random from the code serve to illustrate the general plan followed.[5]

Excerpts from the Code

Section I. Site and Building Location

That the site will vary with the size, type, and organization of the school. It should be sufficient to permit playing fields and courts for all games usually played in schools of that type, space for gardening where needed, a plot for landscaping, space for parking cars, and space for bicycles or horses as needed.

That shade trees at some distance from the buildings are desirable. These should not encroach on the space allotted to field games.

Section II. Construction

That no building without fireproof corridors and stairs shall be more than one story in height.

That buildings with walls of wood or other combustible material shall not be more than one story in height.

That basement rooms be used only for furnace room, machinery and pump rooms or for storage, except that ground-floor rooms with a clear window area above ground equal to one sixth (1/6) of the floor area may be used for shop or play rooms.

That the roof be of fire-resistive material put on with a guarantee of ten years as a minimum.

That parapet walls be capped or made impervious to water.

That flashing be placed above any probable high-water mark, and that counterflashing of metal directly above shall extend far enough into the wall to prevent any seepage.

Model Layouts Provided

To assist school officials in knowing what should be considered when they are planning the various units of any building, committees of teachers, each a specialist in his or her field, were appointed to work up statements and outlines describing desirable units to house certain departments. Plans and specifications are being developed for the high-school gymnasium, library, vocational home-economics suite, vocational agriculture recitation room, primary unit, elementary classroom, artroom, music room, and administrative suites for elementary and high-school principals. These are to be published not as models, but as acceptable unit layouts. They should show school officials how to plan a room adapted to a particular phase or type of school-work. These unit layouts given with a detailed description show school officials in advance what should be included, and prevent the cutting of each unit to a point that it will not render the needed service to the system.

The division of school-building service will provide school officials with other types of building information. Information is collected on building costs for various types of construction so that boards may know approximately how much it will cost to erect a building of a certain size and of a certain type of construction. Information is tabulated showing the cost of each building per pupil, per room, and per cubic foot. Upon request, architects and school-building-supply men are given information of contemplated projects in the state.

Survey of Building Needs

The building division of the state department, in coöperation with the School of Education of the University of Missouri, attempts to give building-survey service to the various districts insofar as funds and the personnel will permit. One service that is given quite freely is that of inspection of existing buildings. This inspection covers safety features, sanitation, and the adequacy of the buildings for service to the school. After this inspection a detailed report is made, showing the school board and local officials the changes that should be made to secure the best service from the existing buildings.

The complete surveys of building needs include such features as population and school-population trends, organization of the school, the school plant, the building program of the future, and financing the program.

Supervision of Construction

Supervision is given in remodeling and repairing old buildings in order to improve the service they render to the district.

New construction is not usually begun until some member of the school-building division has consulted with the local school board and the superintendent concerning their needs for housing service. The department does not attempt to say that school districts shall erect new buildings. In many cases it is necessary to discourage the erection of new buildings where none is needed, or where the district is not able to finance the type of building they wish to build. In a conference with the board

[1] Eighteth Report of the Public Schools of the State of Missouri, pp. 89–90. An extract from the *Preliminary Report of the Survey of Public and Higher Institutions in the State of Missouri, 1929.*

[2] Section 9447 R. S. of the State of Missouri, 1931.

[3] Section 9357 R. S. of the State of Missouri, 1931.

[4] Section 19 of "Redistricting Bill" passed by the Legislature of 1931.

[5] The complete code will be published in a Department of Education Bulletin.

some decision is reached relative to the number of students that are to be housed in a proposed structure, the type of accommodations that will be furnished, and the type of construction desired. After the local officials and the state building supervisor have agreed as to what shall be included, the state supervisor, in coöperation with the local superintendent, sets up educational specifications to include the desired features. These educational specifications are made to care for the present enrollment and the probable future enrollment to be housed in the building, and shows a list of the rooms to be included. Detailed suggestions are made to show the orientation, the size of the rooms, and the location of the building. The following statements are sometimes included:

All buildings two or more stories in height must have fireproof corridors and stairs.

Exit doors must open out and must be equipped with panic bolts.

Windows shall be located within six inches of the ceiling. No windows should be placed within five (5) feet of the front wall of classroom.

Juvenile or baby-sized toilet stools are to be used for lower grade children, etc.

Plan Service to Rural Communities

Particular attention is given to the equipment of various rooms, such as built-in cases and shelves. Specifications are made for the science rooms, shops, and library rooms. They include some comments on the service systems desired. They also include comments on the amount of money that the board will probably be able to spend for the building. These specifications are sent to the board. After an architect has been employed, a copy of these specifications is made available for his use in planning the building. The state does not attempt to furnish architectural plans and specifications for any of the larger buildings. Plans are furnished for one- and two-room rural buildings without cost. This has been found necessary since many districts which require one- or two-room buildings do not employ architects. Even where plans are furnished for these buildings, the school board is at liberty to employ an architect. The state encourages the district to employ architects to make detailed plans and specifications when the building has *four or more* rooms.

From these educational specifications just referred to, the architect makes his preliminary drawings and presents them to the state supervisor and the local board for suggestions. These are examined and suggestions are made for improving them. Oftentimes the architect is invited to the state office to discuss certain changes. The state supervisor does not attempt to be responsible for architectural design and features that are properly the work of the architect and the engineer. However, it is often necessary to check up on certain statements that are known to be wrong, or at least not desirable, in good school-building construction. Such statements are referred back to the architect for correction.

Final Approval of Plans

After the architect has completed the plans and specifications these are sent to the state supervisor and are checked in detail. Check lists for working drawings have been prepared to make it easier to show boards whether the drawings satisfy the educational needs and whether they contain the features that should be included in a complete set of drawings and specifications. When these plans and specifications have been inspected and corrected, the state supervisor approves them. This approval states that the building will be approved if erected as planned. It has been found necessary for some member of the department to attend the "lettings" when possible. Oftentimes the contract bids run higher than anticipated, and certain changes and cuts must be made to bring the building within the money appropriated by the board. If it is desirable to make cuts, the state director assists the board in selecting the places where cuts may be made with the least possible loss of building efficiency. After the plans are approved, all changes that are made should have the approval of the state supervisor before being included in the building.

It has been found advisable for the supervisor of school-building service to visit the buildings under construction several times. This enables him to confer with the board concerning the progress of the building and to discuss any problems that arise. After the building has been completed, final approval is given on a form provided for that purpose.

Contractual Service

An examination of the records of school districts shows that many district boards are not acquainted with the contractual service and the financial accounting necessary in a building program. Some boards have selected an architect and employed his services without knowing his ability to plan school buildings or to supervise their construction. Contracts are often made that do not state clearly what services are to be rendered, or how changes may be made. Illustrations are available to show that districts have suffered losses because of a lack of proper business administration of school-building service. Some of the most common mistakes are: failure to include a definite time limit on contracts; failure to state the type and amount of supervision that the architect shall give; omission of needed features in the contracts of successful bidder; failure to secure a surety bond from each contractor; and failure to include a definite schedule of payments.

To overcome some of these difficulties the state department furnishes forms for a complete contractual service. The use of these is optional, but it is recommended that a district make provision to use these or similar forms. These forms are similar to those published by the American Institute of Architects. There are nine of these forms: forms for contract between the owner and architect, contract between board and the successful bidders, requisition for payment which includes estimates for each unit of construction, final approval forms, bid forms, surety bond, certificates of payment and application for state aid.

Supervision of Operation and Maintenance

The state has obligations in connection with school buildings other than that of construction. The annual report of the state superintendent for 1931–32 shows that the state has about one hundred and fifty million dollars invested in her public elementary- and high-school buildings. It seems advisable that the state assist the local districts in developing a program for maintaining and operating these buildings in an efficient way at a minimum cost to the district. To this end the work of the school-building-service division has been organized to include operation and maintenance service.

School-Building Operation

School janitors are an ever-changing group in the average small school; consequently, teachers and administrators are the ones who will have to set up standards for janitorial service. To assist teachers, administrators, and janitors the state school-building division has prepared, and will have ready for distribution, a handbook for janitors and administrators on school-building care. This handbook covers such features as qualifications, duties, selection and tenure of janitors, and work schedules. It will also include an outline of some desirable working practices in floor care, care of lawns and playgrounds, care of toilet rooms and plumbing fixtures, fire protection, and care of the heating and ventilating system.

In an attempt to assist local school officials in giving training for janitorial service, the state building division has, with the assistance of the vocational division, held several short courses for janitors at various points in the state. It has not been possible to reach all of the janitors in the small towns in these short courses. To assist in interesting these janitors, a series of janitorial conferences are being held in the state. In these conferences on building care topics of interest to the janitor and the administrator are discussed and some demonstrations of desirable working practices are made. As many as sixty or seventy janitors and administrators from the surrounding counties have been present at some of these conferences. It is hoped that these conferences may be followed by short courses for the training of janitors in service at these and other points in the state.

Maintenance Helped

Not much work has been done by the state department of Missouri in connection with maintenance of school buildings other than in those buildings in which complete remodeling has been involved or where insurance programs have been under revision. It has been found advisable to give much attention to school-building insurance. Some buildings are overinsured, while others do not have ample protection against loss. School-board members have no way of determining accurately the value of a school building at the present time, and it has not seemed feasible to employ appraising companies to check the value of the smaller buildings. It has become necessary for the state department to devise a plan whereby it can advise local boards how to determine the present value of their school buildings. A form has been developed for this purpose.

In order to improve the administration of building insurance, the department attempts to render three distinct types of service in school-building fire protection and insurance:

1. A policy form has been developed which offers several advantages over the policy form which is generally used. This policy form may be used as either a specific policy or a specific schedule policy. It includes desirable optional features that may be, but often are not, included in the regular building policies. This form has the approval of the state rating bureau and has been accepted by the insurance companies.

2. The state department and the Missouri Inspection Bureau coöperate in making a survey of the various school buildings in the different counties for insurance purposes, when this service is requested. This is in no sense a rerating program, but it is for the purpose of making a detailed check of the various fire hazards. Following this survey, a summary is made of the hazards in each building in the county with a statement of the added cost in insurance each year because of these hazards. Recommendations are made for removing these hazards and for improving the administration of the insurance program for each particular district. The suggestions include such items as a reduction or increase in the amount of insurance carried, a change in policy form or type, and in the time of maturity. Conferences are held with the school officials of the county to discuss the insurance program for the buildings in their particular county, and to advise the boards how to secure the greatest protection for the amount of money spent, and how to organize an adequate insurance program on an easily worked plan.

3. The department assists local boards in making an analysis of their insurance programs. Rating sheets of each building are examined, as well as are the various policies to determine if a saving is possible through lower rates, a change in type of policy, or through greater coverage. The projection book is examined, and in many cases a new record of the insurance program is outlined. It is often found advisable to change the whole insurance program. A substantial saving has been found possible in many districts by revising the insurance program and better budgeting of the insurance costs. In one district it was found that added coverage of $143,000 could be placed at an average annual cost of $227 less than that formerly paid. It was also found in one system that an expenditure of a few hundred dollars would reduce the hazards to a point where the annual saving in insurance premiums would amount to about five or six hundred dollars. In certain buildings it was found that an expenditure of from fifteen to thirty dollars would reduce the annual premium on each building from thirty to fifty dollars.

The state recognizes its responsibility to assure

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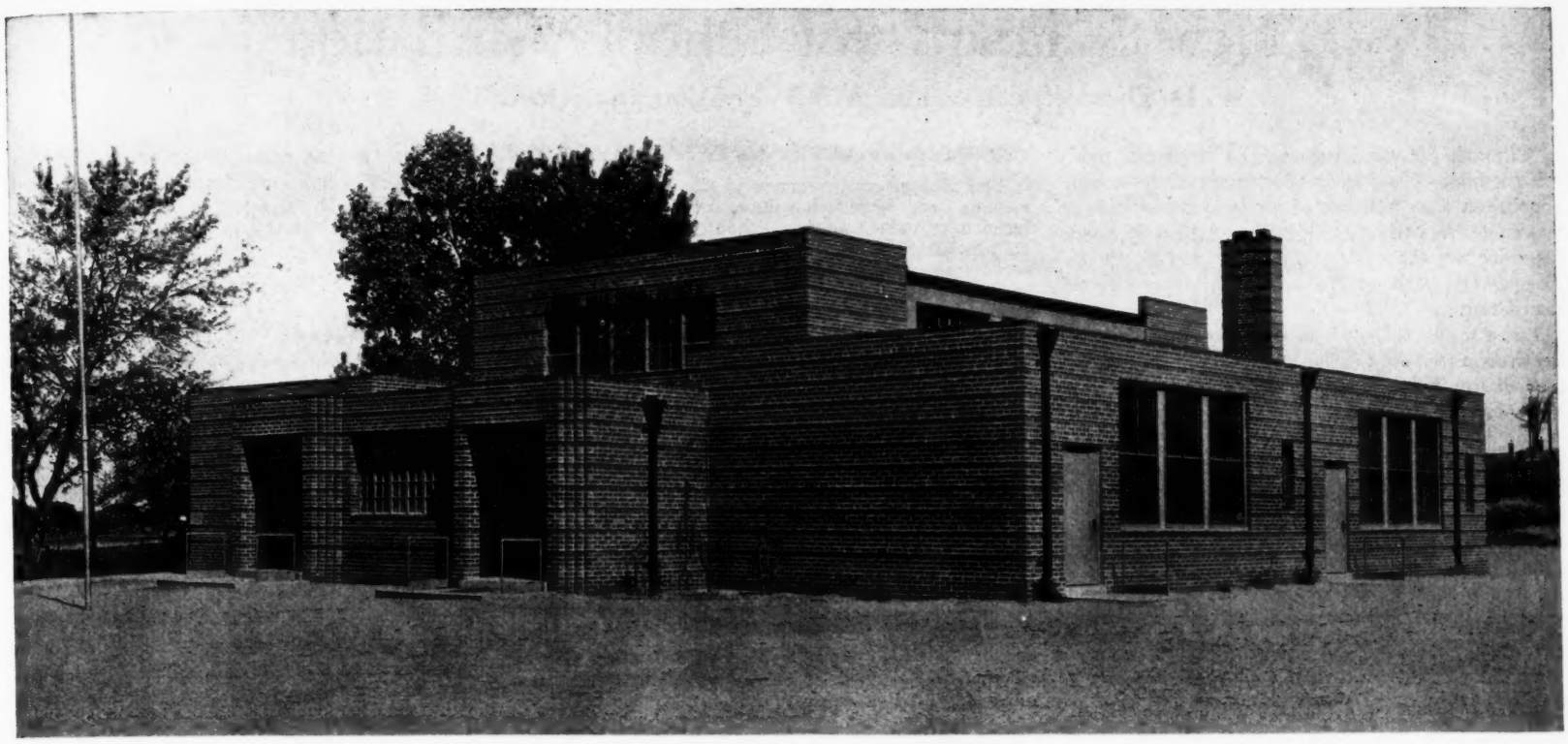


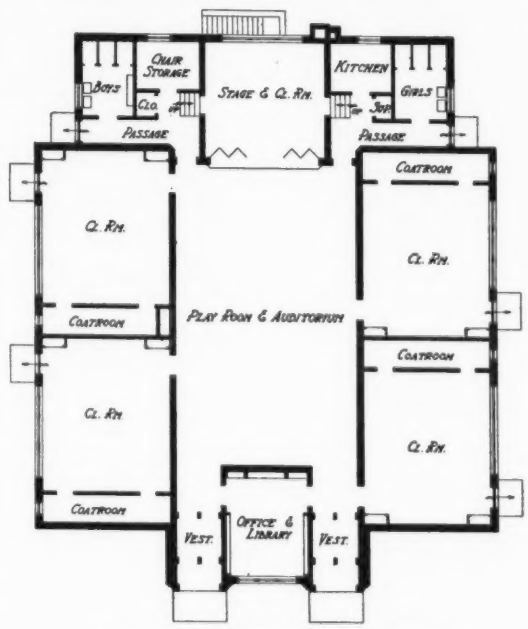
CHERRY HILLS SCHOOL, DENVER, COLORADO
W. E. and A. A. Fisher, Architects, Denver, Colorado.

THE CHERRY HILLS SCHOOL, DENVER, COLORADO

The Cherry Hills School, near Denver, Colorado, was planned as more or less of an experiment on the part of the architects, to demonstrate that a school building can be kept so simple that not one dollar is spent unnecessarily, and that at the same time good design is retained in the simplest form, as well as the best possible construction.

The result of the study carried on by Messrs. W. E. and A. A. Fisher, architects, is a fireproof building of concrete construction, in which only the windows, the doors, and a small amount of trim are of wood. In developing the design, careful attention was given to the problem of reducing to an absolute minimum the important item of upkeep. The main walls of the building are of brick, and the partition walls between the classrooms are terra-cotta tile. The main-floor slab which is laid directly on the ground, requires very little reinforcement and obviates the necessity of outside steps, etc. The soil and drainage conditions, which have been carefully considered, make this economical floor-slab construction possible. The clay tile partitions as installed cost $75 less than wood-stud partitions would have cost. The reinforced-concrete roof cost $300 more than a wood roof would have cost, but involves ultimate economies which will more than offset this additional outlay.

The floors throughout the building are covered with mastic composition tile, except on the stage, where a hardwood floor was placed directly on the concrete, and in the toilets where a smooth-finished cement has been used. There is no basement in the building except boiler and coal rooms, and these are reached by an outside stairs only.



FLOOR PLAN, CHERRY HILLS SCHOOL, DENVER, COLORADO

The building has been greatly reduced in size by the elimination of corridors and the arrangement of a general room which serves as an auditorium and physical-education room, and as a playroom in cold and wet weather. The stage is provided with folding doors so that it may be used for instructional purposes when necessary. A special room fitted with trucks is provided for the storage of the folding chairs used in the auditorium.

Since the building is to be used for community purposes, a kitchen is provided so that meals may be served. This kitchen also is used every day in warming lunches brought by the children from home.

The office is planned to be used as a library and study room. The principal, who is a full-time teacher of one of the classes, occupies this room.

Each classroom is provided with the usual blackboards and bookcases, and has two cabinets, one for books and supplies, and the other for the teacher's wardrobe.

A drinking fountain is provided in each passage.

The playroom has a ceiling height of 18 ft., and the classrooms have ceilings 11 ft. high, while the other rooms have 9-ft. ceilings. The playroom walls are finished in a smooth, gray, pressed brick. The

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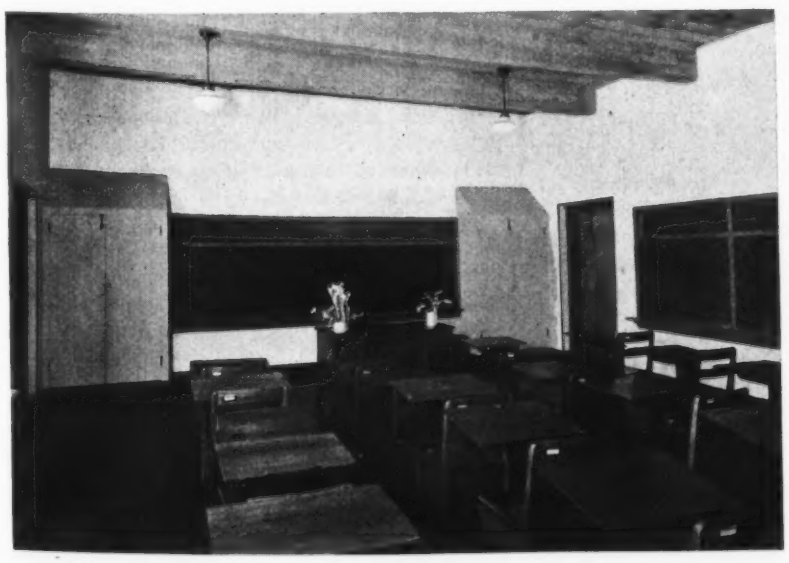

TYPICAL CLASSROOM

PLAYROOM AND AUDITORIUM

CHERRY HILLS SCHOOL, DENVER, COLORADO
W. E. and A. A. Fisher, Architects, Denver, Colorado.

New Standards for School Ventilation

W. H. Driscoll, Chairman, A.S.V.E. Committee, New York, N. Y.

Although Antoine Lavoisier, the "father of modern chemistry," was in error when he expressed the conclusion that vitiation of air in occupied spaces was caused by carbon dioxide exhaled from the lungs, his voice was the voice of authority, and his theory became the basis of the science and practice of ventilation.

Based on his theory, it logically followed that the ventilation of occupied spaces could be accomplished simply by the removal of vitiated air and its replacement by fresh air.

For more than a century after Lavoisier expounded his theory, the study of ventilation was carried on largely by members of the medical profession, who concerned themselves primarily with a consideration of the air quantity, per person, required to correct the carbon-dioxide content of the air. As a matter of fact, not only the determination of requirements, but the means of providing them, were largely accepted as the responsibility of the medical profession.

Early Opposition to Window Ventilation

The simplest way to obtain a change of air in an occupied space was to raise the window, and so the open-window method of ventilation came into existence. Immediately, however, the medical profession found itself confronted with a new problem, the problem of drafts; and hidden away between the covers of some of the ancient books that have to do with this problem, there will be found expressed an insistent demand for some means of introducing fresh air into places of assembly that would eliminate the evils of the open window. The limitations of space available do not permit a review of this subject, but as a typical illustration, the following is quoted from an address made by Dr. Luther V. Bell, before the Massachusetts Medical Society in 1848; his subject being "Ventilating Buildings":

"Experience has ever demonstrated that buildings in which open windows are relied upon are never ventilated at all. In climates like ours, the cold gush of fresh air into a heated room cools, but does not materially change the vitiated atmosphere, while the effect of the draught upon the health is too well admitted to require a moment's consideration."

The first step in the solution of the problem was the determination of the quantity of air to be moved in and out of occupied spaces. Confronted with a definite problem, each individual attempted to solve it according to his own reasoning, and the answers obtained were many and varied. On one fact, however, they were in entire accord; that the displacement of air was the essential thing.

Almost ninety years after Lavoisier had advanced his theory, or about 1863, Max Von Pettenkofer took issue with him, and expressed the conclusion that an excess of CO_2 was not responsible for the symptoms produced by poor ventilation. His opinion was, however, that "bad air" was due to the presence of organic excretions from the body and, on this assumption, he accepted CO_2 as an index of the impurities in expired air. This theory, although directly contrary to Lavoisier's theory, served to confirm the impression that air displacement was the essential thing in ventilation.

Amount of Air Required for Ventilation

From Pettenkofer's data on the amount of CO_2 exhaled per hour and an arbitrary assumption as to the permissible concentration of CO_2 in the room air, it was a simple mathematical process to determine the amount of air, per hour, per person, required for good ventilation. By the year 1875, a standard of 3,000 cu. ft. of air per hour, per person, had been generally adopted by the medical profession. This was later corrected to 2,000 cu. ft. per hour, and finally rounded out at 1,800 cu. ft. per hour, or 30 cu. ft. per minute. More recent

The violent controversies in the field of school heating and ventilation have not been without important values to the schools, both from the standpoint of sanitation and economy. The present paper reflects the most important changes which are now taking place in the standards recognized by the Engineering Fraternity.

—The Editor.

developments have proved, however, that for well over a century the studies and investigations, and even the experiences of medical profession, led them to advance theories and to suggest practices which, while not lacking in virtue, were later found to have been based on erroneous conceptions and to have been fundamentally unsound.

About 1883, investigations carried on at the Hygienic Institute at Amsterdam, indicated that the bad effects of air in occupied rooms were due to excessive temperatures and humidities. These findings, however, appear to have made no marked impression for a considerable period of time. They were confirmed, however, by the evidence of Dr. Flügge, as the result of exhaustive experiments conducted in 1905, at the Institute of Hygiene, at Breslau. Dr. Flügge's views were expressed as follows:

"It is not the chemical composition of the air, but the overheating of rooms that has the chief evil influence on health, and for that reason, it is the latter that must be avoided. The objection to a bad-smelling atmosphere is to be sustained, not on account of its poisonous properties, which have never been proved to exist, but on account of the resulting feeling of nausea; and fresh air is desirable for people not because they then breathe chemically purer air, but because the continual movement of fresh air facilitates the loss of heat from our bodies and exercises, besides, a very beneficial influence on our skin."

Doctors vs. Engineers

Most of the theories on ventilation were heretofore advanced by members of the medical profession acting individually, and there appears to have been no action by any representative group among them to develop standards of optimum atmospheric conditions for either comfort or health. Nor does there appear to be anything in the literature of the medical or allied professions to indicate harmony of thought on the subject.

Despite the history of the subject, criticism of ventilation practices has been directed not at the medical profession, but at the engineering profession. The engineer has fully succeeded in developing means, methods, and equipment for obtaining and maintaining any reasonable atmospheric condition that may be required for health or for comfort; but he has been bewildered in making a choice of conditions to be produced, because of the conflicting theories and opinions emanating from presumably authoritative sources.

The American Society of Heating and Ventilating Engineers is vitally concerned with the problem of ventilation and has made exhaustive studies of the problem at its Research Laboratory, operated in conjunction with the United States Bureau of Mines at Pittsburgh, and in its coöperative studies with some of the leading universities and colleges. In an attempt to stabilize ventilation practices as the result of collective rather than individual action, this society appointed a representative committee to make a careful study and survey of the matter and to submit its findings as to what constituted reasonable standards of ventilation. The committee, after several years of intensive effort, has made its report, and the report has been adopted by the Society.

The New Standards

Ventilation is not an exact science. It cannot be provided in homeopathic doses and in exact proportions to suit the requirements of all kinds and conditions of people, male and female, child and adult, healthy and anemic. The necessity for ventilation, however, is accepted without question by civilized people.

In order to establish principles of ventilation to be broadly applied, it becomes necessary to effect a compromise between the extremes that may be required to satisfy individual demands and to set up such standards as will accomplish the greatest good to the greatest number. Any standard established by compromise is likely at any time to become the subject of debate. The committee was thoroughly aware of this fact and endeavored to ascertain from medical men, as well as engineers, such information as would enable it to set up standards that would be in accord with the broadest experience and most expert opinion.

Although these standards are based on modern knowledge and understanding of the problem of ventilation, they are of course subject to change to meet new conditions, and to conform to a more enlightened understanding, or to yield, if necessary, to such standards as may be set up as the authoritative expression of the medical profession.

The limits of space do not permit the inclusion, in this article, of the complete report of the Committee on Ventilating Standards. It concerns itself primarily with air quality rather than with air quantity, although the problem of quantity is not entirely disregarded. It is divided into five sections, dealing with air temperature and humidity, air quality, air motion, air distribution, and air quantity, respectively.

Under air temperature and humidity, it establishes a limited range of effective temperature as being the index of comfort. Extensive investigations carried on at the society's Research Laboratory have resulted in the development of the effective temperature scale. This is an index of the temperature sensations of the human body, as affected not only by the dry-bulb temperature but also by the wet-bulb temperature. Dry air at a relatively high temperature may feel cooler than air at considerably lower temperatures with a high moisture content, and these temperature relationships are taken into consideration in establishing the effective temperature range required by the ventilation standards. The use of effective temperature as an index of satisfactory air conditions permits of a relatively wide range in the dry-bulb temperature of a room, provided a proper wet-bulb temperature is maintained to give a satisfactory temperature sensation, as well as a proper rate of elimination of bodily heat of the occupants.

Air Quality as a Standard

Although the use of the term "effective temperature" may sound somewhat forbidding, it expresses the most important principle in connection with the whole subject of ventilation and air conditioning. It has been accepted, and is widely used, in scientific circles, and anyone pretending to understand the subject of ventilation must understand its application.

The standard of air quality is such as to require that the air in occupied spaces shall be free from toxic, unhealthy, or disagreeable gases or fumes, and shall be relatively free from odors and dust. There is nothing intricate about such a requirement as that. It is a condition that should be easy to determine and a requirement that admits of no argument.

The standard of air motion required is such as will maintain a reasonable uniformity of temperature and humidity but not such as to cause objectionable drafts. The maximum velocity of air permissible in the occupied zone of a room is 50 ft. per minute.

The standard of air distribution requires that the

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Better One-Teacher School Buildings

A Suggestion by an Architect

O. Z. Cervin, of Cervin & Stuhr, Rock Island, Illinois

There are nearly 150,000 one-teacher schools in our country, practically as many as all other types of elementary schools added together. The teachers in these rural schools have a heavy task. And, what have they to help themselves teach effectively — usually a bare room, with 20 to 40 pupils' desks arranged in rows like soldiers on parade, and a desk facing them. Rarely is there a touch of variety to make such a room attractive and to permit the progressive methods of organization and teaching.

Our city schools, both the grades and the high schools, are practically all well equipped to make the work of the teachers interesting and effective. There are special rooms for the kindergarten, for shopwork, for home economics, for the library. The classrooms are fitted with movable furniture and with built-in bookcases to hold books, magazines, and other teaching aids. Much thought has been given to equip each teacher with the best tools necessary for her work. Why should not the one-room teacher be given a similar opportunity! Hers is no less important job.

Arrangements for the Little Ones

The sketch which accompanies this paper is a suggestive layout for a one-teacher country school. The single large room is a little longer and wider than the average country schoolroom, but not much. It contains the necessary seats, 24 more or less as needed, but the eye is caught by other equipment. There is a large round table, with four or five chairs around it, marked for sewing. There is a small table right in front of — yes, indeed, in front of a real fireplace. This is a low table, suitable only for the beginners, 6 to 7 years old. Why not make it a little easier for the youngsters to start school, a bit more like home than a bench with a table in front and a stiff back behind, in which to sit for endless hours as they usually appear to the young child? At this little table the child can sit and look at his latest picture book or primer, cut out interesting paper things, and color pictures with crayon. Near this low table is a sandbox — try to find something the little child will like better.

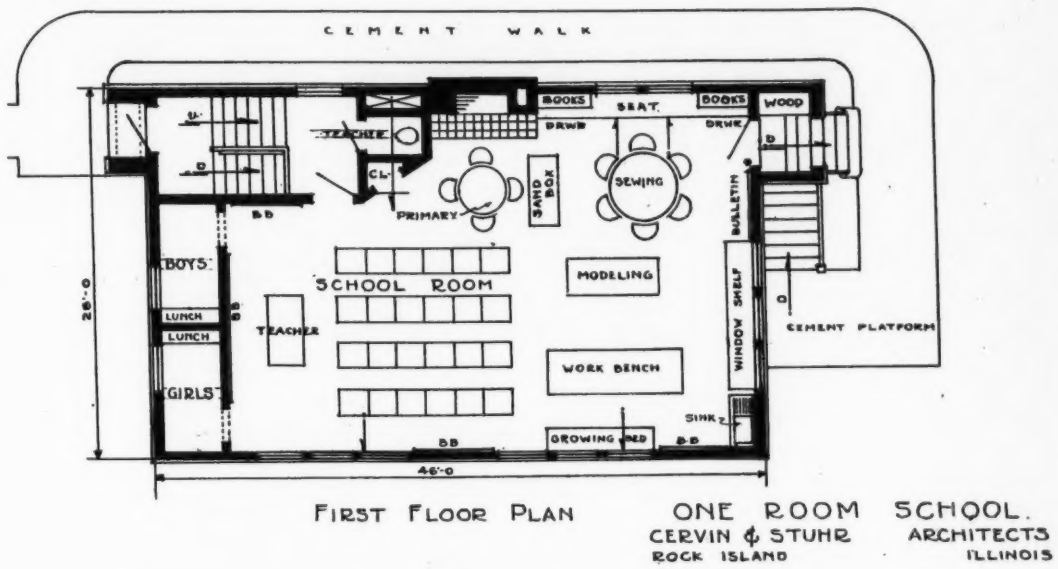
As far away from the corner for the little ones as possible is a workbench where the older boys and girls can find at various times a chance at the less noisy type of handwork. Between the two is a modeling table, or bench, to be used for modeling and paper work — a delight to the children. At the triple window, toward the east, is a wide shelf — for flowers if you will or for work if you so desire. At the three south windows there is a growing bed which has fascination for every child watching the development of plants and flowers. Imagine the interesting touch of color which flowers and greenery may give to a schoolroom. In the corner is a sink.

More Teaching Helps

Do not take exception to the fireplace. It will cost very little, for any good bricklayer can lay it up with common brick and he does not even need to have a tile hearth. He can select the very hardest brick for that.

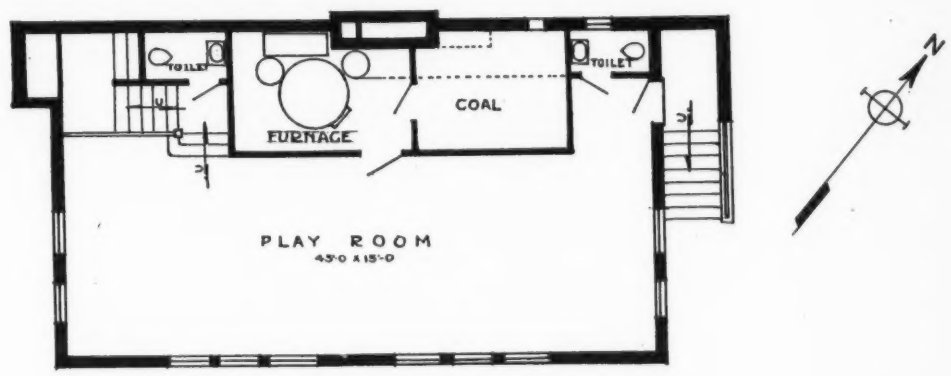
Making a picture with the fireplace, and adjoining it on the right, is a wide, long window seat, with bookshelves on each side and two drawers below the bookshelves, just the place for the teachers' supplies. Outside, but under cover, next to the door, is a ledge for the firewood. Also, there is a closet near the fireplace for maps and the other teachers' tools not suitable to go into drawers.

Of course there is a teacher's desk at the end of the room, with a blackboard behind it. Directly adjoining this desk are 24 pupils' desks of varying heights and suitable for children from 8 to 16 years. Here the advanced ones sit and study not only the three R's but the modern subjects which have been added since some of us went to school. These children are definitely separated from those who are engaged in other pursuits, but it is expected that they will enjoy some of the freedom which the younger children have. The teacher's desk has full view of every activity carried on. Behind her are the wardrobes, into which no child can enter without being directly observed. In this wardrobe are also shelves for the pupils' lunch boxes.



FIRST FLOOR PLAN

ONE ROOM SCHOOL.
CERVIN & STUHR ARCHITECTS
ROCK ISLAND ILLINOIS



BASEMENT FLOOR PLAN

SUGGESTIVE FLOOR PLANS FOR A ONE-TEACHER RURAL SCHOOL
Messrs. Cervin and Stuhr, Architects, Rock Island, Illinois.
The very interesting arrangement is intended to meet the newest ideas in school organization and teaching method and is to provide ample facilities for the use of the building as a community center.

Can the Teacher Use All This?

Perhaps you will ask why so much paraphernalia for one teacher? And the architect answers, Why not? Does she not have eight grades and must she not prepare children for high school? But, says the objector, No one teacher is able to make use of so much equipment. Answers the architect: Perhaps many teachers cannot, but they do say that a surprising number are versatile enough and welcome the chance to use the socialized-recitation and, the project methods, and all the other interesting methods which keep boys and girls busy and give them relief from the old, narrow memorizing and bookwork. At least one county superintendent has said that many of his teachers would use every bit of the equipment in such a room. Perhaps the country teacher is quite as capable as her city sister after all.

In the basement, which is well set up, eight steps above the ground, so as to be lighted and ventilated, is a playroom large enough for much fun on rainy, stormy days. Here are boys' and girls' toilets at each end; and, by the way, there is a separate toilet for the teacher on the main floor. Of course you have noted there are two exits from this school. No fire marshal will find fault with that. The furnace in a separate room, with a coalroom adjoining, has a large heat duct with three return-air ducts from the schoolroom above. Ventilation is through the fireplace, so you see this feature is not for looks only and has a useful rôle to perform.

The Planning of the Building

Speaking of the blackboard behind the teacher, there are four others, one of which is near the workbench, suitable for special work. And of all modern things, next to the door is a large bulletin board or tacking strip.

Then, how to place the building. Doctors all advocate plenty of sunshine. North exposure is the poorest. Those who know, say that east is best, and that if it cannot be had try to get the southeast, but by all means avoid the north — cold, chilly, uninviting during the long winter months.

Now, let's have a vote and every teacher of one-room schools in the whole country cast her ballot and let her say which one of these features she would dispense with. We shall let the majority rule and in the next schoolhouse plan to throw out that which is black-balled as superfluous.

Also, let the community vote. Here is a big room. All of the tables are portable, even the desks should not be bolted down. In a few minutes, the room can be cleared. What a place for a neighborhood frolic, with big logs sputtering away in the fireplace! Or, add some chairs to the scene and plug in a picture machine, or have a little program, a concert, or a lecture. The room will seat about 125. Now, will the community vote to give the teachers this kind of schoolhouse, or will it vote "no"?

Sight Conservation Through Better Blackboard Illumination

H. L. Logan, Illuminating Engineer, New York City, New York

The needs of civilization require the formal education of children under conditions in which they are helpless to protect themselves against dangers that menace their health, and that may result in lifelong handicaps. One of these dangers is impaired sight. The eyes of school children are immature and will not withstand the abuse to which adults ordinarily, although unconsciously, subject them.

Defective sight is rare in children in the lower grades, but by the time they finish elementary school, one out of every four has developed refractive errors requiring optical correction. By the time they are through with high school three out of ten have developed refractive errors, and when they finish college, nine out of twenty have had their eyes impaired. Children that leave school before completing their education do not develop a proportionate degree of impairment.

With these startling figures before us, no architect or illuminating engineer can be charged with acting in self-interest alone when he presses his recommendations for better school lighting.

This subject has been thoroughly studied and the effect of schoolwork in impairing sight has been definitely established. Some elementary steps toward correcting this condition are beginning to be generally recognized and approved, such as the elimination of window area in the immediate neighborhood of the blackboards, the arrangement of windows on one side of the room only, higher artificial-lighting intensities, and special sight-conservation rooms in which the principle of radial seating is used for pupils with greatly impaired sight.

However, before a real step forward can be taken, we will have to wait for wide acceptance of the facts that daylight is frequently inadequate for classroom lighting and that more scientific lighting will compensate for refractive errors, as well as tend to prevent their development.

To digress a moment and illustrate this last statement, Figure 1 shows the rate of reading by the normal eye for different degrees of illumination, and its comparison with the performance of the astigmatic eye. The curves clearly show the greater rate at which speed of reading by the astigmatic eye improves over the rate of the normal eye under increasing illumination, and further show that when the illumination reaches intensities comparable to common practice in commercial offices and the more up-to-date factories, the rate for the astigmatic eye is almost the same as for the normal eye. However, this range of intensities is greater than daylight levels, over a large part of the typical classroom under average conditions.

Meanwhile, a worth-while improvement can be made by adopting the principle of blackboard illumination, so that pupils who are handicapped by placement in the room, as well as those that are visually handicapped, may be effectively helped.

The blackboards at the front of the typical classroom are "work boards," the rest of the boards being used for data of a semipermanent nature. The special blackboard lighting may therefore be confined to the front boards. Optically speaking, blackboard lighting will do more good over the front boards adjacent to the windows, as these boards show a condition of mild veiling glare or sheen to one third of the seats and a condition of severe glare to one half of the seats; i.e., they are free from obscure visual conditions to only one sixth of the seats, and therefore could stand the greatest degree of lighting correction.

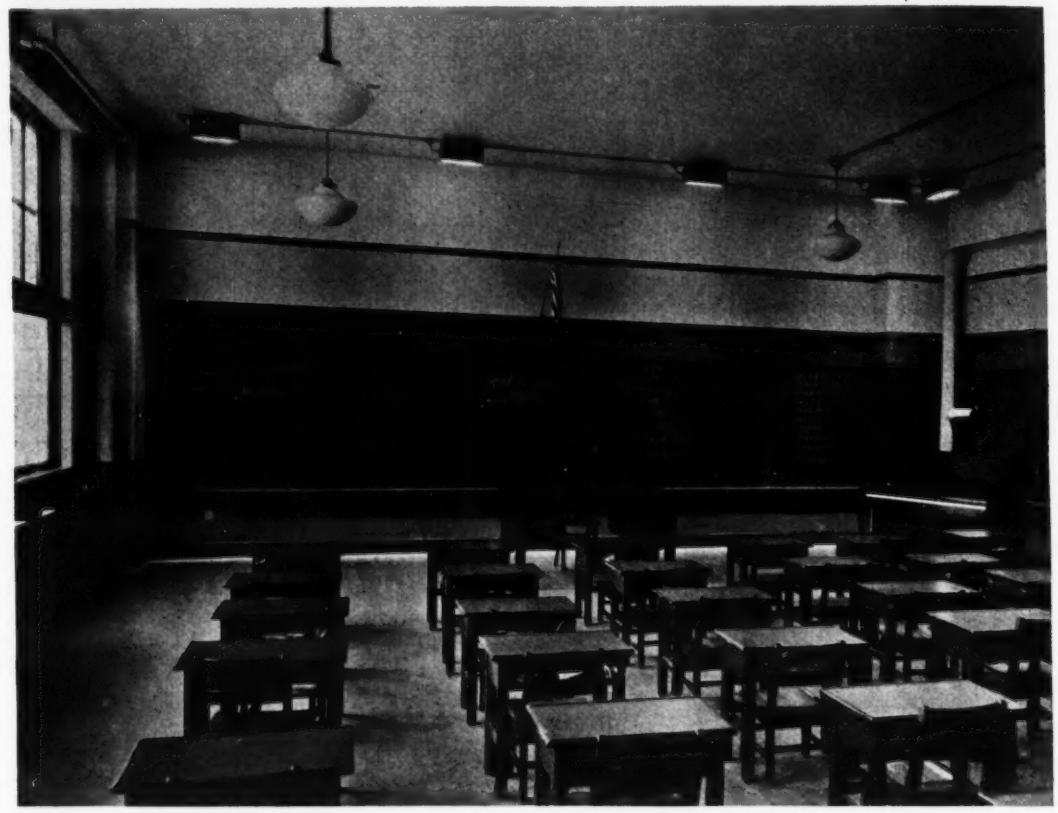


FIG. 2. A CLASSROOM IN PUBLIC SCHOOL NO. 22, JERSEY CITY, NEW JERSEY, fitted with eight blackboard lighting units for special use under unfavorable daylight conditions and for night school classes. Each of the eight blackboard lighting units is equipped with two 150-watt lamps.

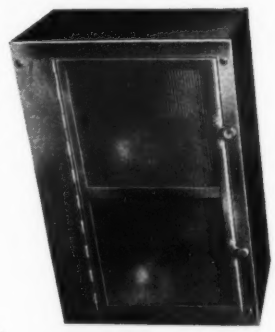


FIG. 3
Typical Controlens unit for illuminating schoolroom blackboards.

However, the central board is most frequently used, and although it does not produce severe glare to any seat in the room, it does cause mild glare to about one half the seats and this, coupled with the frequency of its use, indicates that this is the board that should be lighted if economy dictates the restricting of lighting to one board only.

Fig. 2 illustrates the use of such blackboard lighting in a classroom of Public School 22, Jersey City, N. J. The type of equipment is illustrated in Fig. 3 and consists of a pair of combined lenses mounted in a housing with Mazda lamps and reflectors behind, the double optical trains so arranged that the light is thrown on to the blackboard in a wide uniform "sheet" at a steep angle. This prevents reflections of the unit itself, no matter how polished the blackboard may become, from being thrown into the eyes of pupils.

The use of the lenses permits all of the light from the unit to be refracted, or bent in the direction of the blackboards, so that from the pupils' side of the classroom the units appear luminous only, and of lower brightness than the usual classroom fixtures.

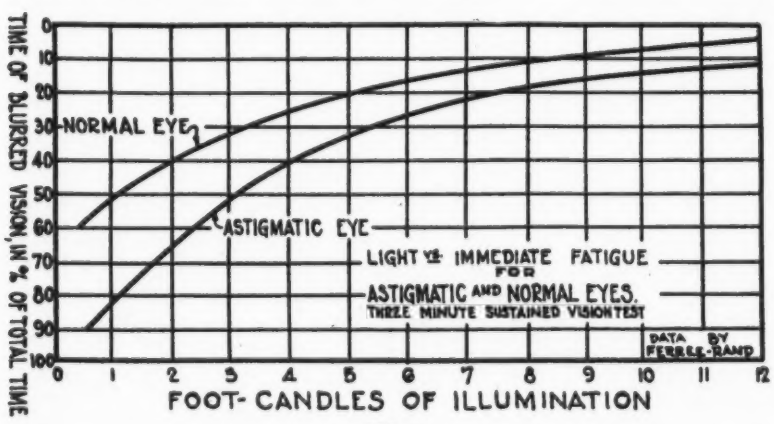


FIG. 1
Curve illustrating the improved rate of reading of both the normal and the astigmatic eyes for different degrees of illumination.

ANNUAL REPORT OF THE FEDERAL OFFICE OF EDUCATION

The United States Office of Education, in its annual report issued on December 4, anticipates that the next year will present serious difficulties which will affect the office adversely in its present efficiency, prestige, and future development.

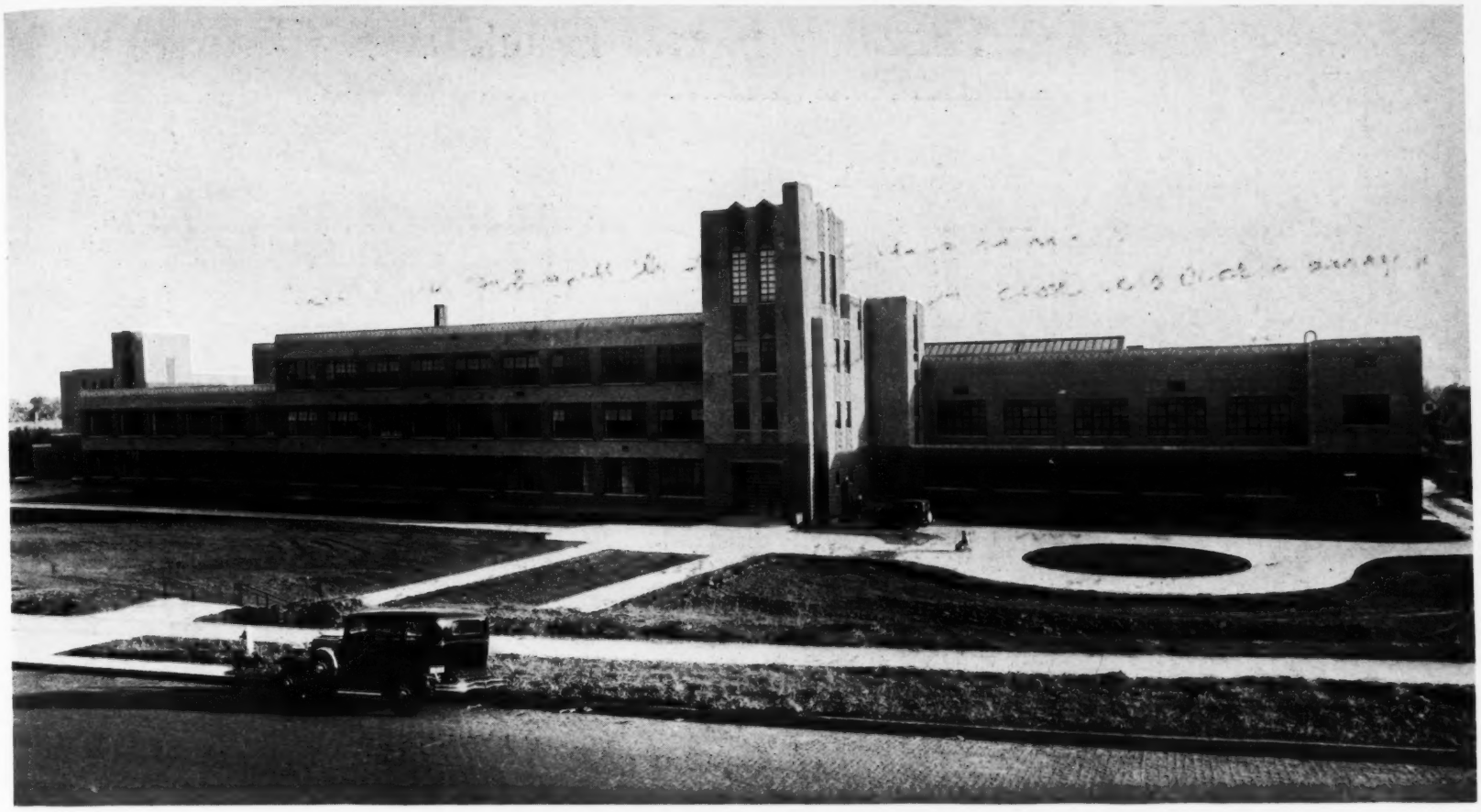
During the past year, the problems investigated by the office staff have been of three major types: (1) those arising out of the present economic situation as it affects education; (2) those which may be termed status or descriptive studies of new and promising movements in education or of conditions for which there are frequent and urgent requests for information; (3) those periodic studies of various phases of education for which the office has been considered an authority. Replies to more than 250,000 letters, 114 publications, exhibits at conventions, articles for periodicals, and *School Life*, the official monthly journal, gave official facts to those who could make use of them.

Thousands of teachers, parents, students, administrators, college and university heads, research workers, and various state and local school administrative officers, and professional organizations were among those served by the office during the past year.

The report points out that the Office of Education's program of major educational surveys was curtailed by government economy.

♦ A campaign to remove more than 2,000,000 children from employment by putting them back into schools so that "jobs may be given the ten to eleven million adults now in need of work" has been announced by the National Child Labor Committee.

The committee in its statement, estimated that more than two million boys and girls of the ages 7 to 17 years are gainfully employed, while from ten to eleven million adults are in desperate need of work. The Committee urged that there be a united effort to remove from industry all children under 16 years; to require a higher age for school leaving.



THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS
Hewitt, Emerson and Gregg, Architects, Peoria, Illinois.

A Modern Schoolhouse for a Modern School

THE PEORIA SCHOOL-BUILDING PROGRAM

E. C. Fisher, Superintendent of the Peoria Public Schools

The Peoria board of education, because of the financial situation in which it found itself, and because of the many demands made for added activities in the schools, determined, ten years ago, to entirely revise its method of financing the school district, without sacrificing any of the fundamentals necessary for achieving an acceptable educational program. After careful consideration, the board voted to have a survey of the school system in order that the fundamental facts might be known and understood. The members felt that they could more easily proceed in developing plans if they had a statement of actual conditions, of indicated needs, and of recognized educational standards.

The survey, which was made under the direction of the late Dr. C. E. Chadsey, of the University of Illinois, revealed, among other things, the following facts:

1. Peoria was low in illiteracy. This has been confirmed by the recent census which places Peoria and Long Beach in the forefront of cities of 100,000 population. Peoria has 0.5 per cent of illiteracy.
2. The educational achievement of the schools was good.
3. Standard tests revealed that Peoria education ranked in effectiveness above the standards achieved throughout the country.
4. Schoolrooms in certain sections of the city were overcrowded.
5. The survey committee recommended the junior-high-school plan of organization as the best solution for the problem of improving the schools. The platoon plan was considered inadvisable.
6. Positive recommendations were made for the purchase of school sites in properly distributed locations, for the purpose of erecting the recommended junior high schools and needed elementary schools.

In considering the survey report, the board of education was immediately confronted with the problem of so adjusting the finances of the schools that the balance would be on the right side of the ledger, especially with reference to projected school buildings. A careful study revealed three possible ways of paying for the proposed buildings:

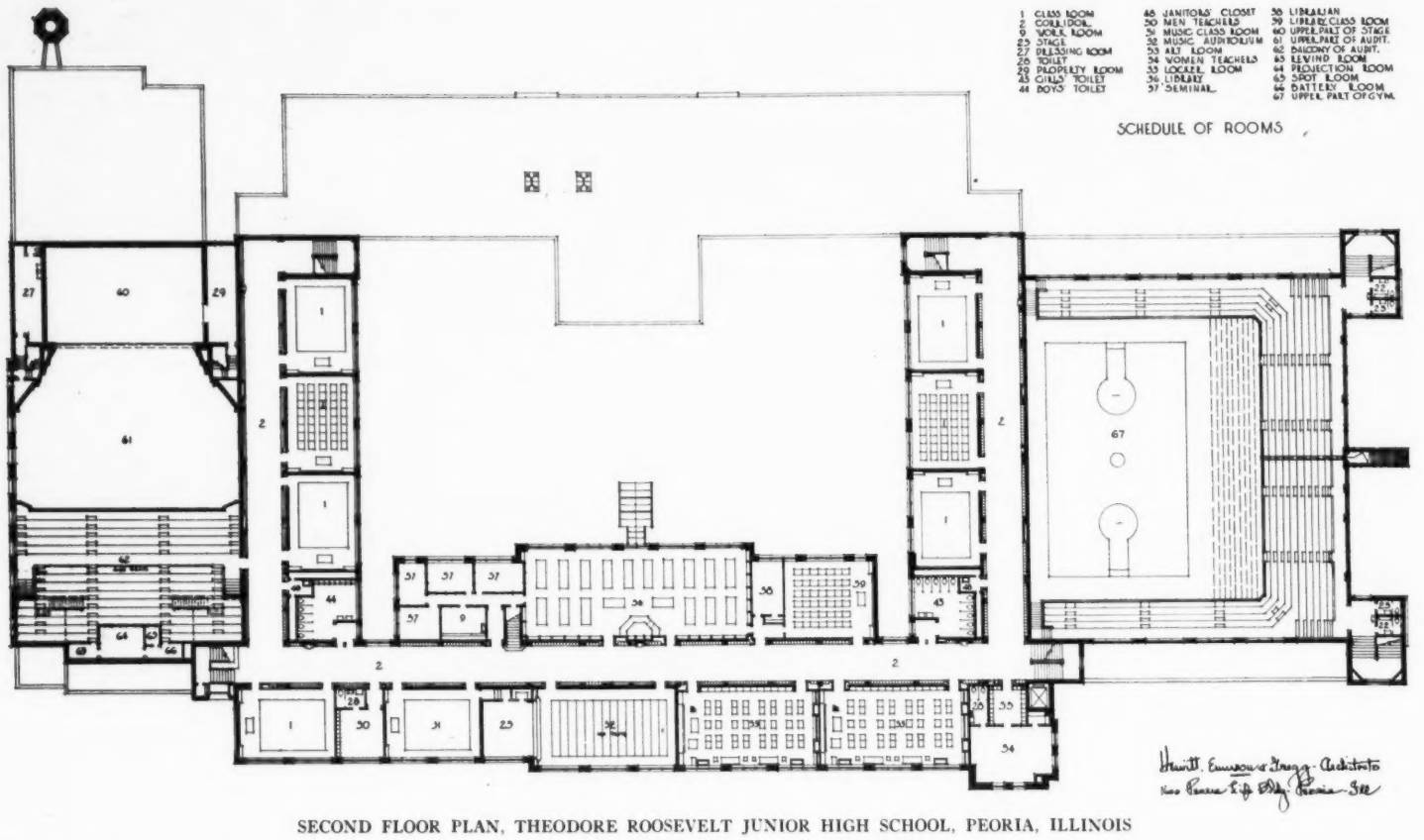
a) By means of bonds, which is the most common method and which must be authorized by a vote of the people.

b) By the pay-as-you-go plan, which involves an increase in the tax rate sufficient to provide the funds for immediate erection within a given year.

c) By the depreciation plan, whereby an additional tax is levied each year for several years, in advance of the construction of a building, and the fund so accumulated, together with the interest earned, produces an amount sufficient to build the building at the end of a given period.

After much study, the Peoria board of education adopted the "depreciation" plan. It was shown that a school building to be erected at a cost of $300,000, would involve an outlay of $481,454, if the bonding plan were applied and serial bonds were issued for the usual number of years. If the pay-as-you-go plan were adopted, the immediate outlay in a single year would be $300,000, a sum that

AUDITORIUM, THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS
Hewitt, Emerson and Gregg, Architects, Peoria, Illinois.



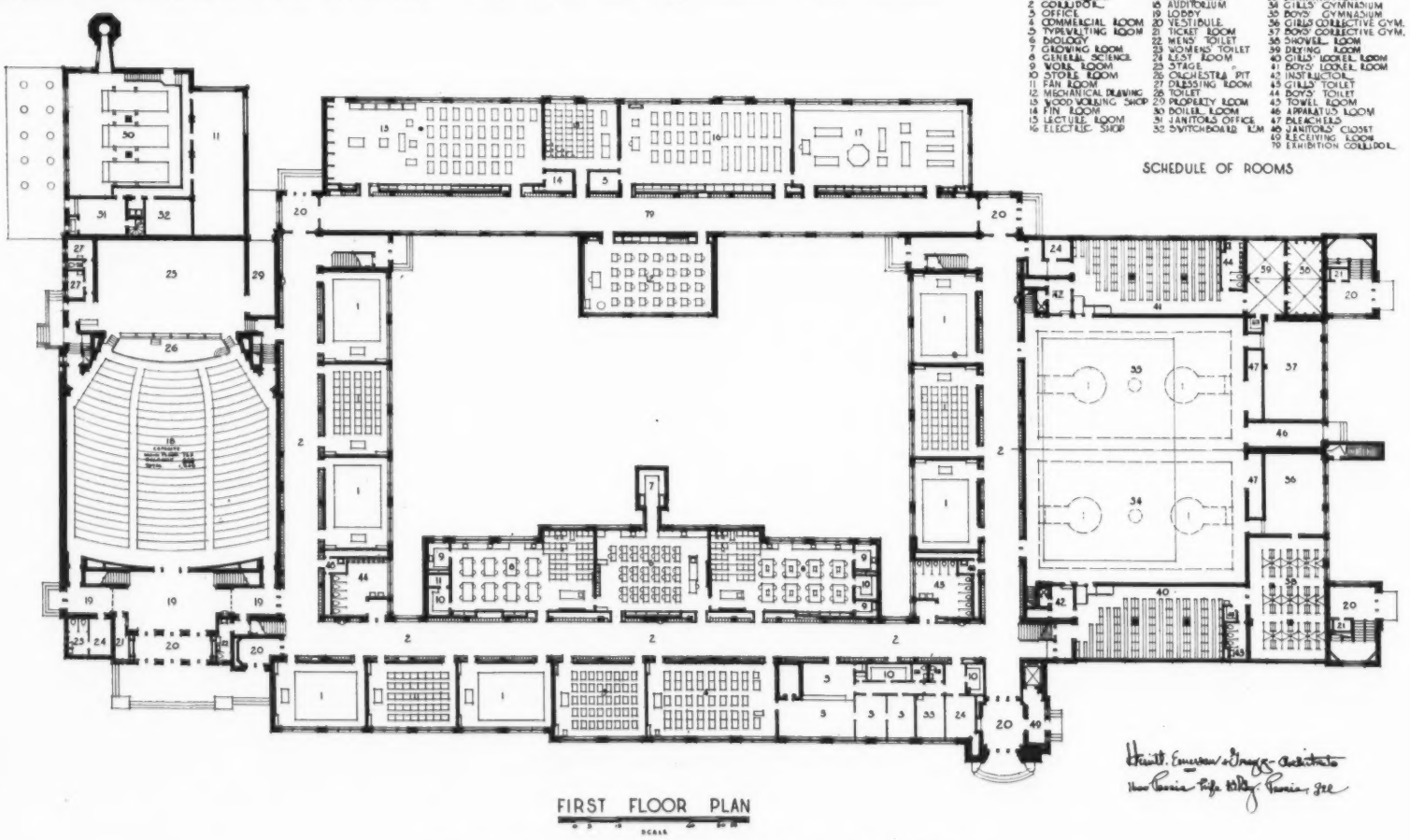
SECOND FLOOR PLAN, THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS

would raise the tax rate out of all proportion. If the depreciation plan were used, money raised during a period of years in advance would bring in $181,454, and this last amount. plus the interest thereon, would total $300,000. It is clear that the last-mentioned plan, which was adopted by the board, is the most satisfactory one.

With its financial plan in hand, the board of education in 1924 revised its instructional and supervisory program, by dropping the number of supervisors and special teachers from the payroll, at an annual saving of $35,000. In March, 1929, the board set up what it termed its ten-year building program. On November 4, 1929, a special election was held for the purpose of increasing the revenues in the educational fund from $1 to $1.25 and in the building fund from 37½ to 50 cents. The election was carried by a vote of two to one, insuring the first important projects of the program. The objectives of the ten-year building program were (*a*) to build three junior high schools within ten years; (*b*) to erect such new grade buildings and such additions to old buildings as would be necessary; (*c*) to reinstate certain activities which had been dropped from the program in 1924 because of the shortage of funds.

With only a very small increase in the tax rate since 1929, and with the savings in the reduction of the teaching and supervisory forces as indicated above, the board of education has been able to carry on and to translate the financial situation from red to black. In October, 1929, the board began to anticipate the receipt of tax money for the payment of current bills. In 1932, the anticipation warrants were issued for one month only, indicating a steady improvement in the condition of the educational fund. During the years, the board was able to purchase sites, erect necessary additions to existing buildings, and to build new schoolhouses totaling in cost $1,741,124. In addition to these, economies were made in educational costs so that it was possible to retire $455,000 worth of bonds. The total outlay for new and enlarged buildings was $242,467 for real estate, $1,374,976 for building construction, and $123,679 for furnishings.

The figures indicate the foresight of the board of education, which permitted the readjustment of the finances of the school district since 1924 and which have made it possible to face the present depression with considerable confidence. All of the school sites for new buildings or additions have been paid in full, and the close of each fiscal year



THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS

has found both the educational and the building funds in the black. The Theodore Roosevelt Junior High School, illustrated in these pages, was paid in full when the building was completed and the keys accepted from the architect and the contractors.

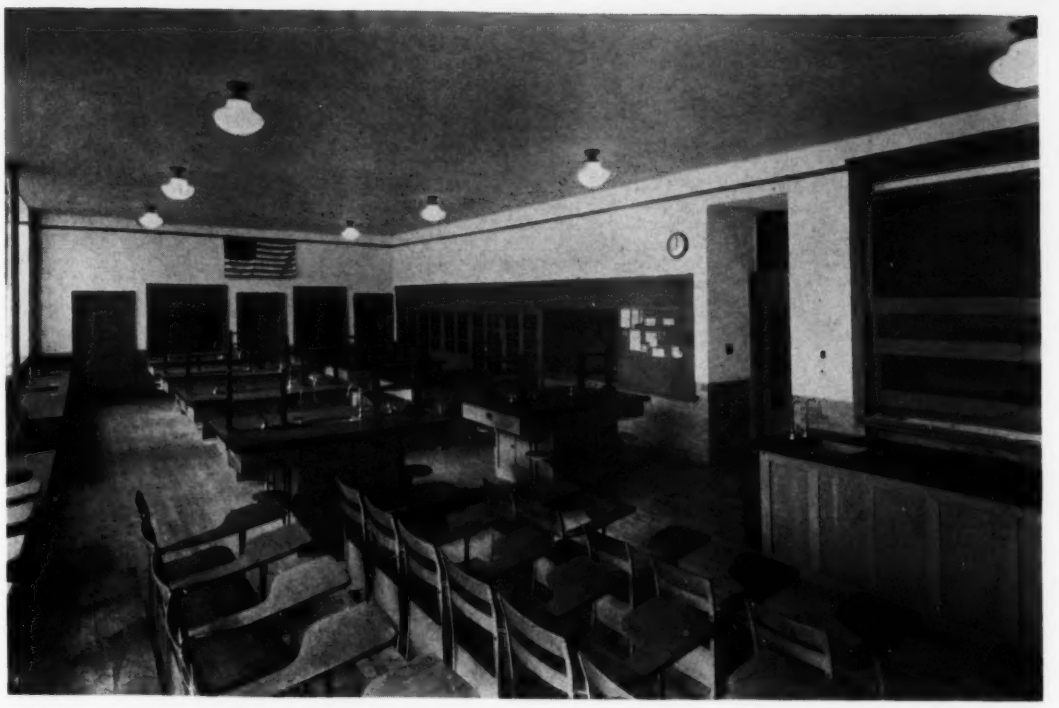
While the board of education considers it wise not to erect further buildings at this particular time, it will be ready as soon as business improves to go on with its program without any hardships or any excessive taxation on anyone.

THE THEODORE ROOSEVELT JUNIOR-HIGH-SCHOOL BUILDING

R. S. Gregg, of the Firm of Hewitt, Emerson, and Gregg, Architects

Since the incorporation of the Peoria ten-year school-building program in March, 1929, two new buildings — the Columbia Elementary School and the Theodore Roosevelt Junior High School — have been completed and occupied. The latter building was opened September 1, 1932, and was formally dedicated on September 30.

In planning for the building, the board of education conferred with educational experts in the field of junior-high-school education. A year was devoted to this study of the supervisory and teaching programs to be developed in the school. The special teachers and supervisors of the Peoria schools were brought into the conference and their ideas were sought. When the formal meetings were concluded, the board of education was able to say with reasonable certainty what facilities should be incorporated in the building in order to insure success from the educational standpoint.



SCIENCE LABORATORY, THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS

From the beginning of the project intimate contact was set up between the educators and the architects. The public was also kept in touch with the program. Each served as a check on the other. The results indicate that only the best in educational procedure and building refinements was incorporated in the plan and the construction.

GYMNASIUM, THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS

The Building

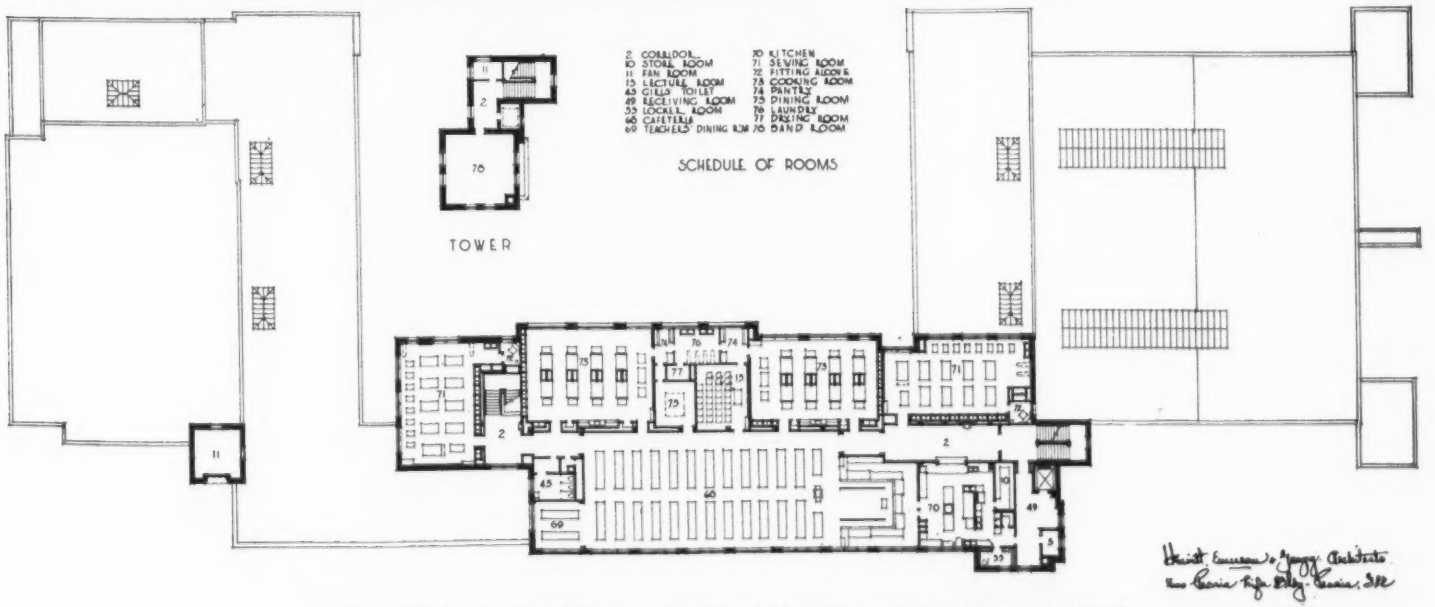
The exterior of the building is composed of a series of masses, grouped together so that the interest in the structure rises from the grouping rather than from architectural adornment or ornamentation. The exterior expresses the function of the plan and the unity of the several parts.

The exterior walls are of two shades of tan brick, with pale cream terra-cotta cornices. The main entrance at the base of the large tower is of polished Missouri red granite, and white metal grilles are provided in connection with this entrance and the entrance to the auditorium to emphasize the character of the entire design. The selection of materials for both interior and exterior use was made with a view of economy, permanence, and minimum upkeep.

The over-all dimensions of the building are 450 by 232 ft.

The contracts for the building were awarded on September 30, 1931, and the building was completed August 15, 1932. The total cubic content of the building was:

Auditorium unit and boiler room..	608,125 cu. ft.
Gymnasium unit	643,973 cu. ft.
Classroom unit	888,214 cu. ft.
Shop unit	304,050 cu. ft.



THIRD FLOOR PLAN, THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS

TOP, Music Auditorium; MIDDLE, Mechanical Drafting Room; BOTTOM, Art Room

THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS

Hewitt, Emerson and Gregg, Architects, Peoria, Illinois.

The cost of the building, including the general contract, plumbing, heating, ventilation, and electric wiring was $951,947, which did not include the equipment. The cost per cubic foot was 24.2 cents, and the cost per pupil was $394, an exceedingly low unit cost, considering the high quality of the materials.

The total number of stations in the building, including boys' and girls' gymnasium classes, is 1,664, giving a nominal pupil capacity of approximately 1,500.

The building is built on the unit plan, there being four units as follows: (1) auditorium unit; (2) classroom unit; (3) gymnasium unit; (4) shop unit. These units are built around a court 177 by 102 ft., interconnected by spacious corridors and so arranged that any one unit can be used independently of the others. The placing of the shops in a separate unit makes for a minimum of disturbance from shop noises. The various units contain rooms as follows:

Auditorium unit: An auditorium with 1,200 seats; a large stage and proscenium provided with projection room, dressing rooms, and storage for stage scenery; a large entrance lobby, public toilets, etc. Directly behind the auditorium is the boiler room and space for mechanical equipment.

Classroom unit: The classroom unit contains the following rooms:

Seventeen classrooms with forty desks each.
Commercial rooms, typewriting room.
Two general-science rooms.
Biology laboratory.
Library, librarian's office, library classroom.
Four seminar rooms and workrooms.
Two artrooms.
Two sewing rooms.
Two cooking rooms.
Laundry.
Household-economics dining room.
Household-economics lecture room.
Cafeteria.
Cafeteria kitchen.
Music room.
Music auditorium and stage.
Men and women teachers' retiring rooms.
Boys' and girls' toilets on each floor.
Bandroom and general and private offices.

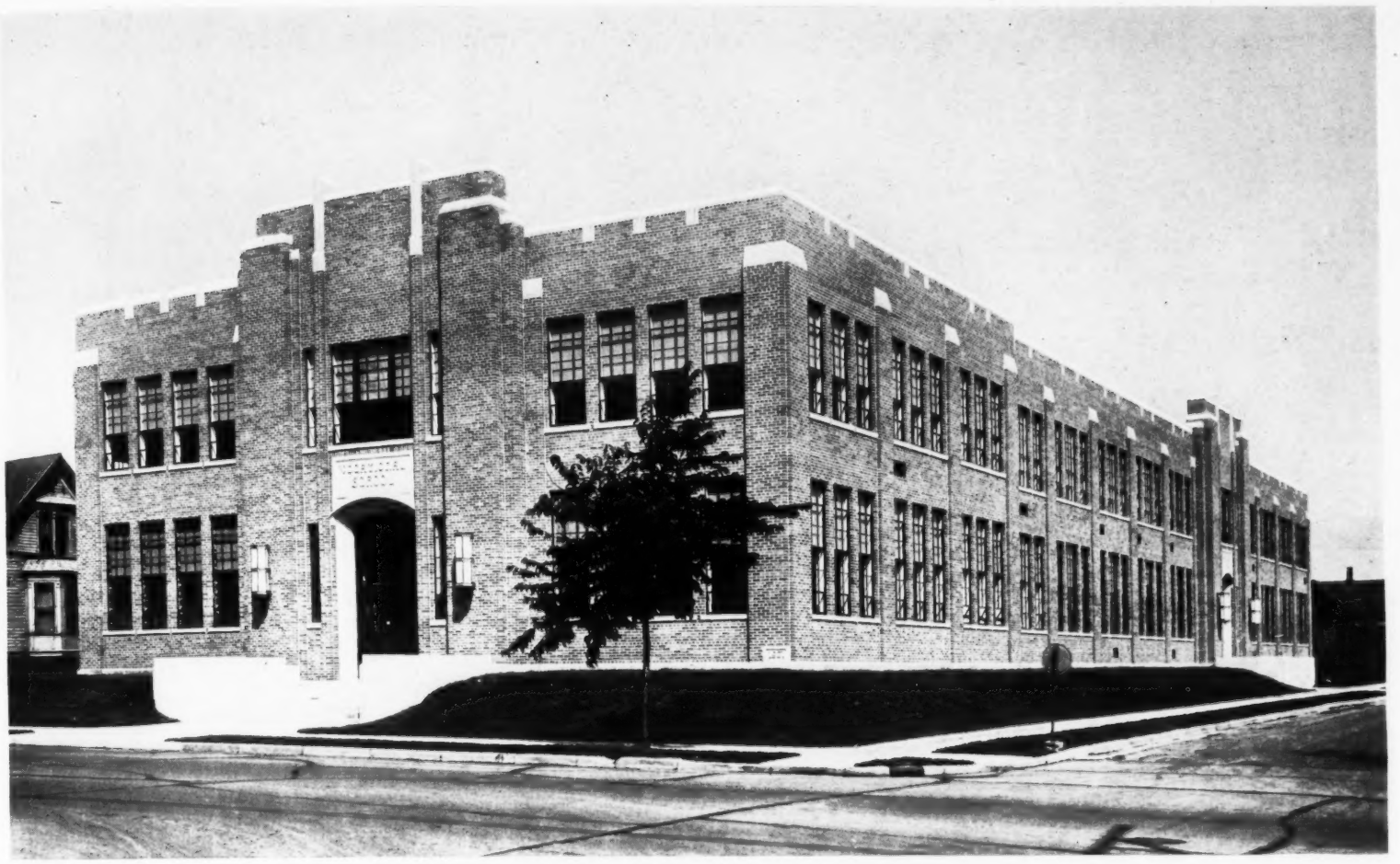
Gymnasium unit: The gymnasium unit contains two gymnasiums, one for boys and one for girls, separated by a movable partition operated by an electric motor. When the partition is open, the total playing space is 90 by 75 ft. The gymnasium is surrounded by 1,200 seats for spectators, placed on concrete risers. The seating capacity may be increased by 500 by the use of portable bleachers.

Boys' and girls' locker rooms are provided. The locker system is arranged for six classes, and each class of 100 each is provided with individual lockers for street clothes. The locker rooms are placed at the ends of the gymnasium partly under the bleacher seats. Adequate shower rooms are also provided for boys and girls. The gymnasium instructors' offices are placed so that the instructor has a full view of the gymnasium and also of the locker room.

Two public entrances to the gymnasium seating are provided, each with a ticket office placed so that the gymnasium can be used independently from any other portion of the building.

Shop unit: The shop unit contains a mechanical-drawing room, woodworking shop, electric shop, metal shop, and shop lecture room. The corridor is lighted by the large court of the building and may be used as an exhibition corridor, both for shop products, drawing exhibits by pupils, or art exhibits from the outside. The building is planned for the utmost in convenience, economy of operation, and abundance of light.

(Continued on Page 68)



MANITOWOC VOCATIONAL SCHOOL, MANITOWOC, WISCONSIN
William J. Raeuber, Architect, Manitowoc, Wisconsin.

A Central Vocational School Building

The Manitowoc Vocational School

The most important progress in school architecture during the past decade has been made in the planning and construction of school buildings for vocational and part-time schools. This improvement has arisen from the fact that educators were largely at sea within as late as 1922 concerning organization and teaching trends in vocational subjects. Sufficient experience and a large number of scientific studies have made it possible to outline more definitely each year the actual building needs for vocational subjects, and to eliminate the waste which has risen from unwise layouts and excessively large shops, workrooms, etc.

The new vocational school at Manitowoc, Wisconsin, illustrates very clearly the new efficiency in vocational-school buildings. The school has been carefully planned to meet a comprehensive program in vocational and part-time education in a small community which has a wide variety of industrial interests. The building occupies a plot measuring 150 by 420 ft., and is located in the heart of a middle-class residence neighborhood. The building, as erected, is "T" shaped, 255 ft. in length and 130 ft. in width. It is two stories high, and the only portions which are below grade are the gymnasium and the boiler room.

The gymnasium, which is arranged with a stage and has adjoining it lockers and showers, is planned to serve both as a general assembly room and as a physical education room. It is fitted with permanent bleachers, underneath which are the showers and lockers.

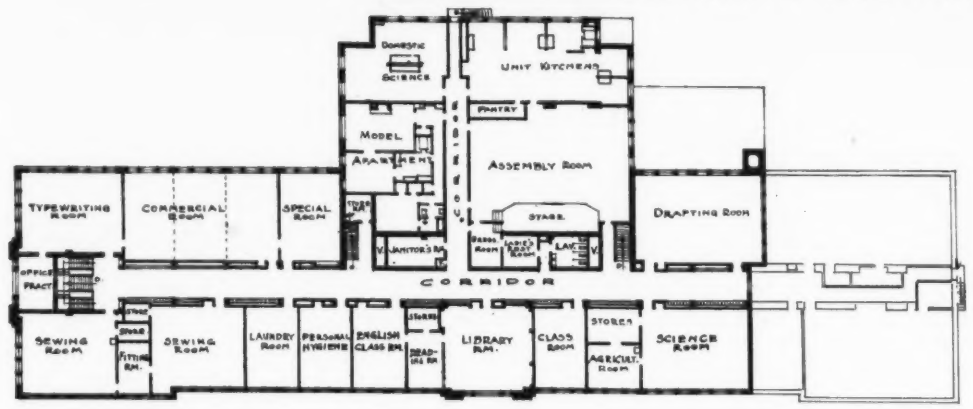
The first floor contains the four large shops in which there is heavy machinery. On this same floor also there is an office suite, including a conference room, private offices for the principal, and the coördinator, a vault, and a storeroom. Of the four shops, two have small recitation rooms, adjoining. Each of the rooms has space for tools and storage, and each is finished and fitted in typical factory style.

The second floor contains three rooms for commercial subjects, two sewing classrooms with a fitting room between, a laundry, a domestic-science suite, a drafting room, two home-economics rooms, a library, three recitation rooms, and a small assembly room. The last-mentioned room serves for double class groups and for extracurricular activities. It is fitted with a stage and several dressing rooms.

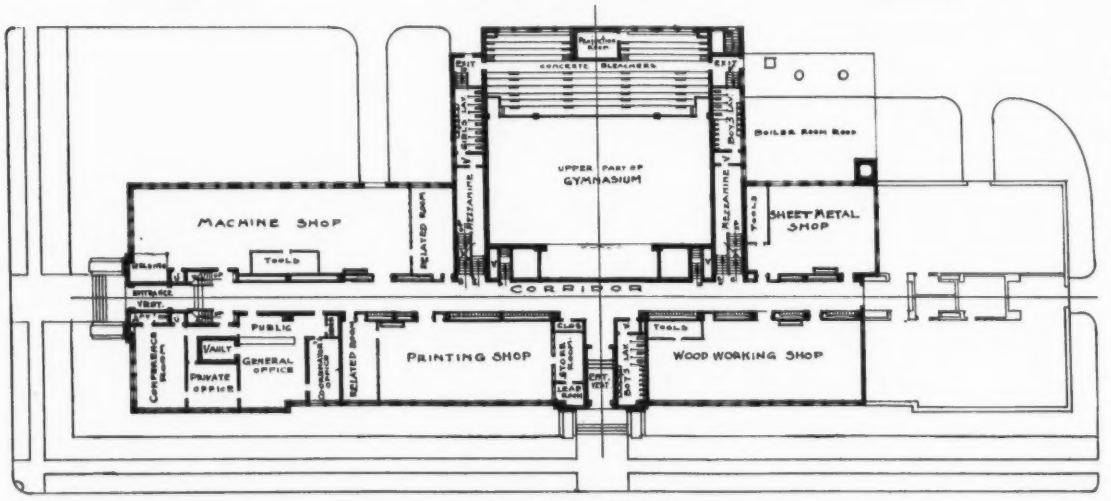
The building is constructed with concrete foundation walls and footings. The pipe tunnel for the steam mains runs inside the outer perimeter of the building so that the concrete floors which are laid directly on the earth fill, are never cold and cannot

MACHINE SHOP, MANITOWOC VOCATIONAL SCHOOL, MANITOWOC, WISCONSIN
William J. Raeuber, Architect, Manitowoc, Wisconsin.

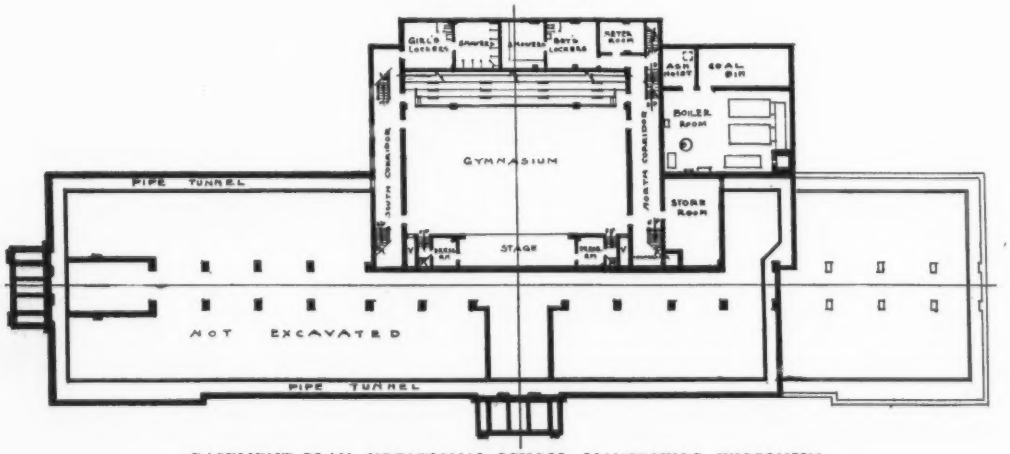
UNIT KITCHENS, MANITOWOC VOCATIONAL SCHOOL, MANITOWOC, WISCONSIN



VOCATIONAL SCHOOL MANITOWOC-WIS. • SECOND-FLOOR-PLAN • WILLIAM J. RAEUBER-ARCHT. MANITOWOC-WIS.



FIRST FLOOR PLAN



BASEMENT PLAN, VOCATIONAL SCHOOL, MANITOWOC, WISCONSIN
William J. Raeuber, Architect, Manitowoc, Wisconsin.

be affected by frost in the coldest winter weather. The upper floors and the roof are concrete slabs, carried on steel beams, and the walls are of brick and concrete blocks. All of the interior is carefully fireproofed.

The corridor walls, toilet-room walls, and gymnasium walls are lined with buff salt-glazed brick tile. The classrooms and other rooms, except the shops, have plastered walls and ceilings.

The floors are of quarry asphalt tile, except in a few rooms where maple flooring was considered necessary. Floors in toilet rooms, vestibules, etc., are covered with quarry and mosaic tile. The outside windows are all set in steel sash. The wood trim throughout is red oak. The blackboards are genuine slate.

The electrical equipment includes complete power lines for operating the machinery and wiring for the fire alarm, telephone, call bells, etc. All instructional rooms contain intercommunicating telephones and program clocks. Fire-alarm stations and signal bell are installed.

The building is equipped with a complete vacuum-steam heating and ventilating system, with dual automatic temperature control. Classrooms and shops have direct radiation and unit ventilators. Steam is developed in two low-pressure, automatic stoker-feed boilers. The 96-ft. ornamental chimney is designed in harmony with the balance of the building.

The sanitary installation is of the heavy-duty type, with toilets, urinals, wash basins, etc., of solid porcelainware and fixtures of brass.

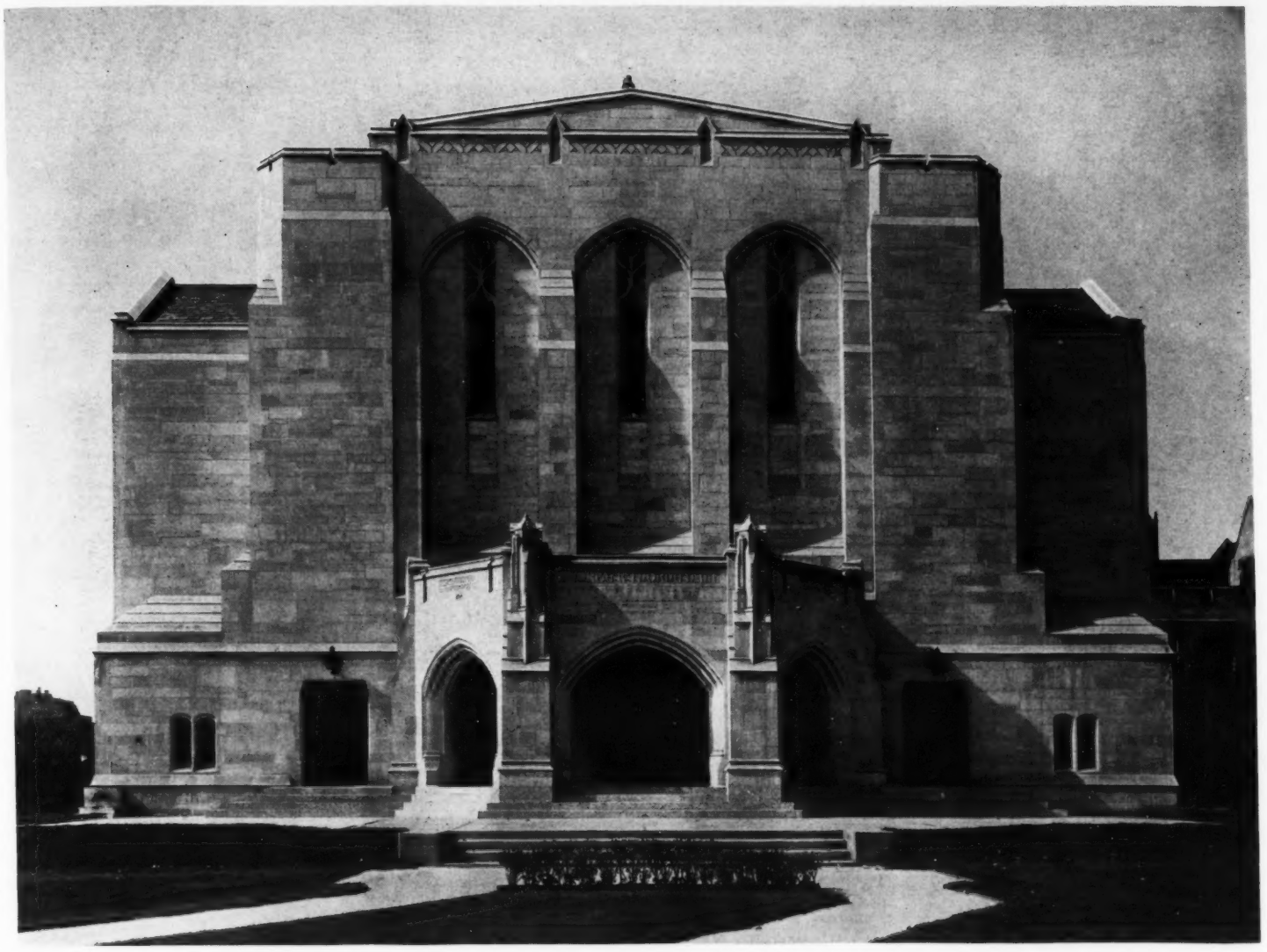
The building was designed and the construction was supervised by the office of Mr. William J. Raeuber, architect, of Manitowoc. It was completed in September, 1932, and occupied at that time. The cost was $240,000.

N.E.A. TO MEET IN CHICAGO IN 1933

The seventy-first annual meeting of the National Education Association will be held July 1–7, 1933, in Chicago.

The convention headquarters will be in the Stevens Hotel, which will also afford accommodations for registration, exhibits, meetings of the assembly, official committee, and board meetings. The general sessions will be at the Stevens Hotel and the Eighth Street Theater adjoining. Departmental meetings will be held in the Stevens, the Blackstone, the Congress, and the Auditorium Hotels. The international exposition, The Century of Progress, will be open during the convention.

Information about the meeting, the hotels, and other details of the convention may be had from Mr. John F. Bowman, director of conventions, Stevens Hotel, Chicago, Ill.



DETAIL OF ENTRANCE TO THE GEORGE R. THORNE HALL, McKINLOCK CAMPUS, NORTHWESTERN UNIVERSITY, CHICAGO, ILLINOIS
James Gamble Rogers, New York, and Childs and Smith, Chicago, Associated Architects.

Thorne Auditorium—A Demonstration in Architectural Acoustics

Susa P. Moore

The George R. Thorne Hall, dedicated in October to student assembly activities on McKinlock Campus, Northwestern University, Chicago, is built with supporting walls of Indiana limestone in weathered tones. There are no piles of stone built up in towers. There is slight, if any, period tradition in architectural line and mass, and yet its freedom of design in a subtle and satisfactory manner is in perfect harmony with the other earlier buildings on this campus. James Gamble Rogers, New York, with Childs and Smith, Chicago, are collaborating architects on this project which in its final form becomes a strict expression of the modern type of internal, functional plan.

The structure is in fact a double building. It houses two separate auditoriums, one large, one small, completely isolated from one another and almost independent as to service rooms. The problem was to produce a center for student community activities which would provide for meetings large and small. It was desired to facilitate the open forums which have become so much an educational feature in the schools of medicine, dentistry, law, commerce, journalism, and at the same time to provide instant facilities for lectures, movies, talkies: and which would utilize to the best advantage the great organ and make conditions right for orchestral programs and vocal music.

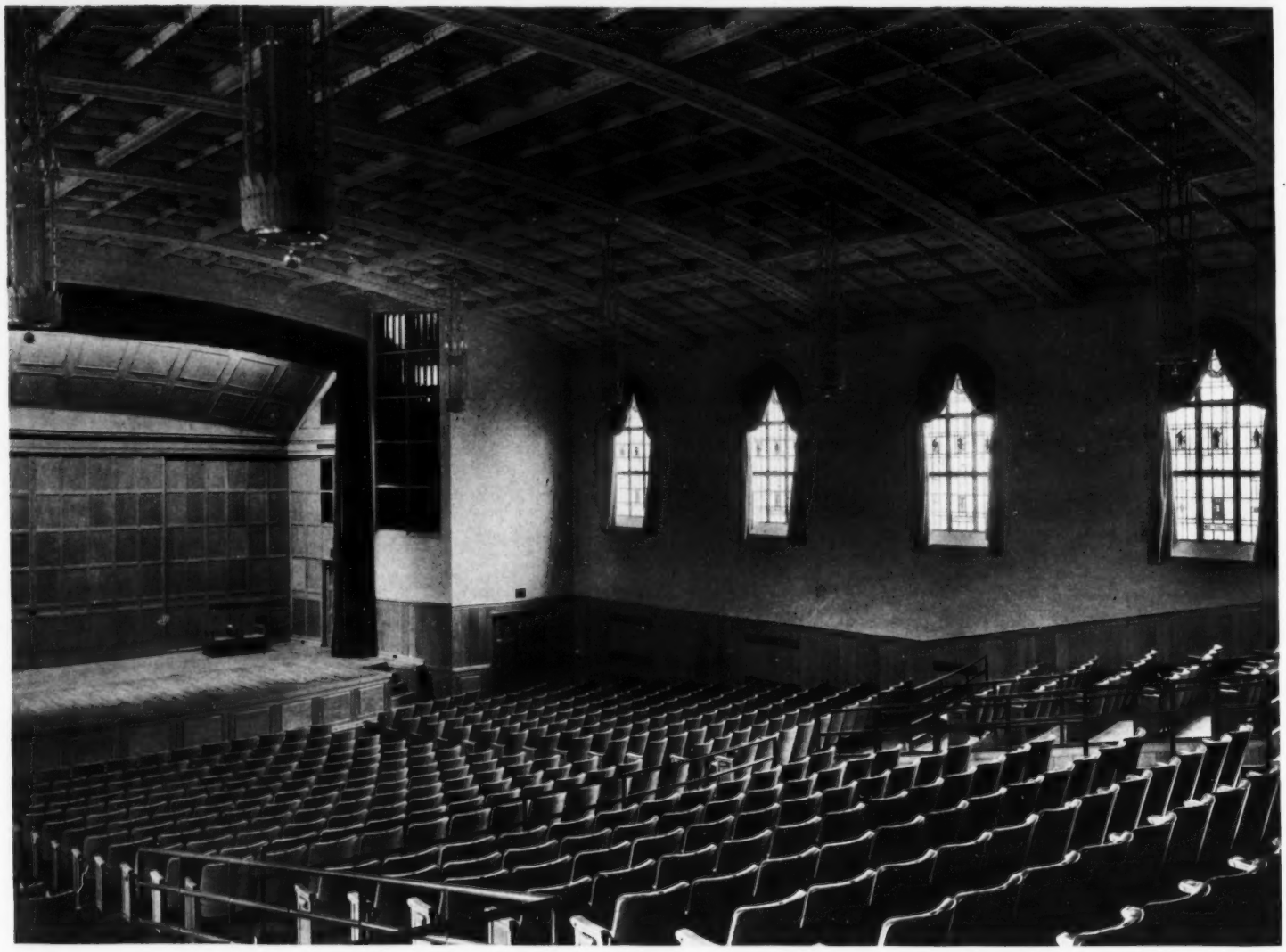
The smaller lecture room on the ground floor will accommodate 400 persons for classes, demonstrations, or for social gatherings. The furniture is movable. The floors are finished for dancing. There is a stage, with spectator galleries; and accessory kitchens and dining rooms give versatile applications to this space. This lecture room has separate lobbies, checkrooms, restrooms. It is sound-proofed and has every facility for independent use without confusion.

Color has been introduced into the decoration of the lecture room and a feeling of informality is created by the use of a *toile de Jouy* wall pattern in the entrance hall. The same feeling of informality is carried still further in the rooms back stage. There is usually too little accommodation for persons on stages. The Thorne Auditorium has a lobby on each side of the stage where large numbers of persons can move about with ease. Smokers will be held here, and general meetings. There is a long lounge accessible to both stages, reminiscent of the Green Room of earlier theaters. These rooms, and other small retreats for individual speakers, are common service rooms, accessible from either stage.

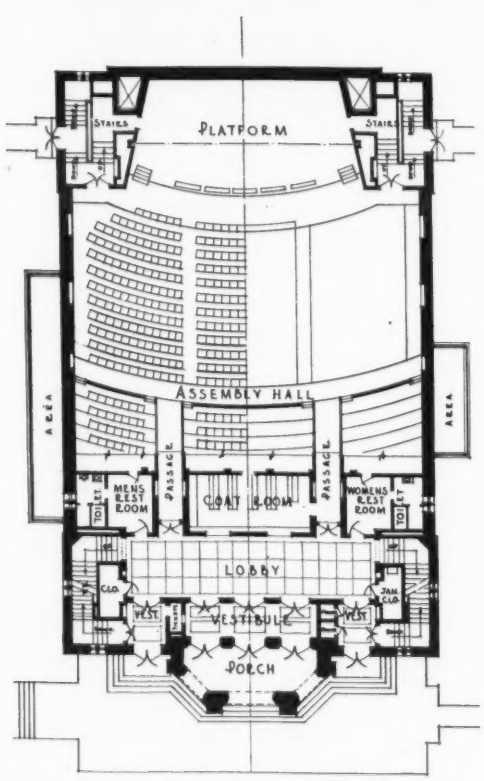
The special interest in this building centers in the design of Thorne Memorial Auditorium on the main floor, which is the direct outcome of recent studies in architectural acoustics carried through by William Jones Smith, of Childs & Smith, with Paul E. Sabine, acoustical engineer. Visits were made to many of the more important theaters and assembly halls throughout the country known to be well designed for good effects of orchestral and other music. Recorded tests with all dimensions were made of conditions in such rooms. The demands of good acoustics are responsible, state these men, for newer architectural trends in the best theaters and auditoriums, and it is good architecture which looks so closely to good building function. Very few auditoriums like the George R. Thorne Hall have been built in this country. It has no galleries or other deep recesses whose depth and relatively small opening interfere with good audition. A full one-story rise from front to back tiers of seats assures each person in the rear an unobstructed view of stage. Toward the back each tier shows a 7-inch rise as against the average 3- or 4-inch rise. This means that each person has a direct path for waves of sound from the stage, precisely calculated, and the three fifths of the audience in the back of the room hear quite as well and easily as is usually the case for the commonly favored two fifths in front.

People enter this room by way of ramps which lead directly to points near the central portions of the auditorium. Rustling noises from the lobby are absent under such an arrangement, and there are no vagrant sounds from the opening and closing of doors. The side walls are relatively low and, on this account, states Mr. Smith, it was not necessary here to incline them slightly at the front as must be done when walls act like sounding boards in intensifying coughs or crinkling of programs and other audience noises.

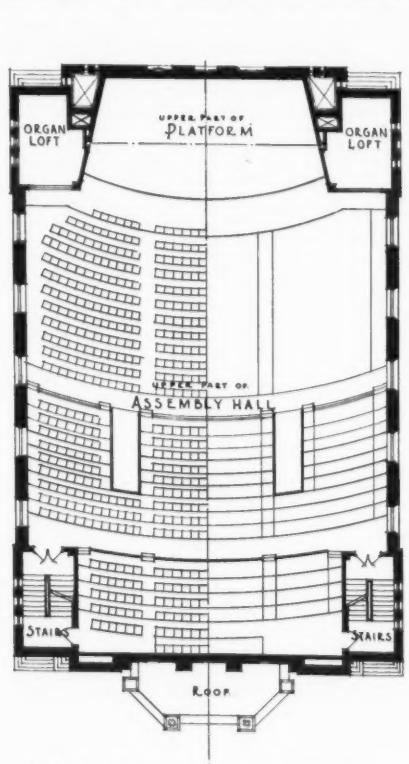
The curve of the ceiling and its height are the major means of sound control within this room. The room dimensions show a length of 90 feet with a width of 71 feet, more than double the average height of 30 feet. Side walls are encroached upon by the curved ceiling. They are 24 feet in height. The wide curvature of the ceiling has been calculated in a manner that meets the sound conditions in a room of these proportions. Unlike the earlier favored domes in theaters, the reflected sound from a curve of this character would concentrate at a point of 30 feet beneath the floor. There are no areas here of concentrated sound. Furthermore, the ceiling is cross-beamed and broken up into discreet panels utilized as decorative motifs, and quite appropriate



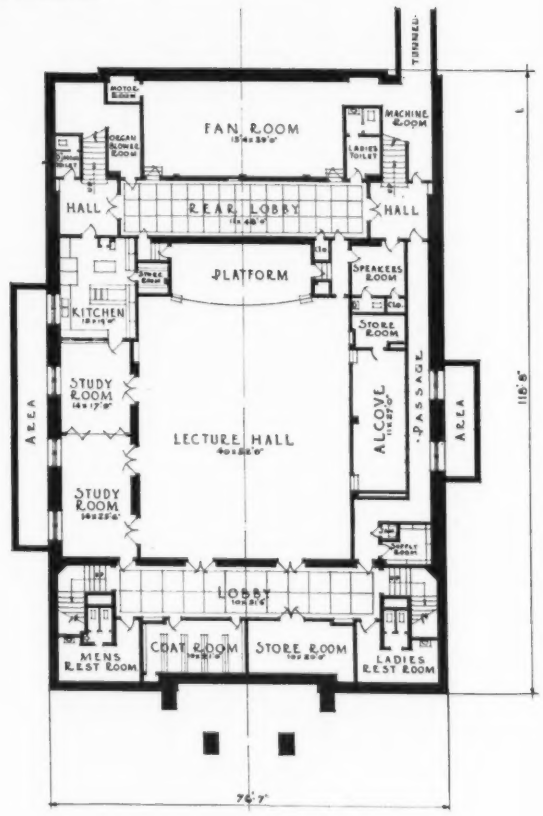
INTERIOR VIEW, GEORGE R. THORNE HALL, McKINLOCK CAMPUS, NORTHWESTERN UNIVERSITY, CHICAGO, ILLINOIS
James Gamble Rogers, New York, and Childs and Smith, Chicago, Associated Architects.



FIRST FLOOR PLAN



UPPER PART OF ASSEMBLY HALL



GROUND FLOOR PLAN

GEORGE R. THORNE HALL, McKINLOCK CAMPUS, NORTHWESTERN UNIVERSITY, CHICAGO, ILLINOIS
James Gamble Rogers, New York, and Childs and Smith, Chicago, Associated Architects.

for the precise application of sound-absorbing panels.

The stage itself is 18 feet deep by 43 feet average width. It is finished with wood panels throughout to promote resiliency. The back portion of these panels slides back to reveal a perforated sound-movie screen always in place for instant use. The sides of the stage slope outward to favor resonance at the point of sound incidence. The stage opening is brought up flush with the ceiling to obviate the unpredictable sound-reflection phenomena which are such a frequent cause of sound impurity in the average auditorium.

The total cubage of the room is 210,276 cubic feet (191,700 without stage). It seats 850 persons. Final tests of sound conditions in the room have been 100 per cent satisfactory. The entire acoustical problem of an auditorium thus is proved to be amenable to calculation in advance. The dimensions and proportions of the room were developed by experts before any drawings of a plan were undertaken.

It is an interesting document, this preliminary draft of the George R. Thorne Hall. Nothing in structural use in modern life is really soundproof. Areas must be calculated and construction methods set down for every type and quantity of materials used. Absorbency rates will range from linoleum, 2 to 3 per cent absorbent; plaster, 1½ to 3 per

(Concluded on Page 74)

New Standards for School Lighting

Architectural, Engineering, and Educational Organizations Set Up Revised Standards for a Lighting Code

The scientific research and the practical manufacturing development of the past decade in the field of schoolroom lighting have been brought to bear upon the development of a revised code for the satisfactory illumination of schoolrooms. The new code, approved during the past fall by the coöperating organizations of educators, medical men, architects, engineers, interested public official bodies, etc., has just been made public under the general sponsorship of the Illuminating Engineering Society and The American Institute of Architects. The standards set up are intended to insure minimum satisfactory conditions for natural as well as artificial lighting. The report holds "The sense of sight is by far the most important medium by which pupils learn. In studying, a pupil's eyes take countless visual impressions of images. If the lighting and visual conditions are such that these images are taken rapidly and clearly, a lesson will be learned more quickly, and with less drain upon the child's resources. It has been repeatedly demonstrated that many pupils considered backward were merely struggling under the handicap of not seeing well.

"The direct result of this preventable backwardness is an economic waste, both through loss of the pupil's time, with the inevitable discouragement which follows failure, and the additional expense to the school system. If poor lighting and the resulting imperfect seeing are responsible for preventing annually only a very small percentage of the pupils from passing, the cost to the school system of having these pupils repeat the year's work may easily be as much as the total school-lighting bill for the entire year.

"The immediate benefits which proper school lighting affords the pupil, important as they undoubtedly are, are probably overshadowed by the ultimate benefit of conserving vision. It is well known that eyestrain and eye fatigue may be due to inadequate or glaring lighting. Disorders such as irritability, nervousness, dizziness, and headaches result from abuse of the eyes. Eyestrain can be of such duration as to result in permanent impairment of vision, particularly in the case of children, whose eye muscles are still in a relatively plastic state. Good lighting is an important factor in helping to prevent such impairment."

What Constitutes Good Lighting?

Schoolroom illumination defined in terms of quantity requires sufficient light for safety, conservation of vision, and general efficiency. Defined in terms of quality it involves the correct location of sources of illumination, good color, good distribution and diffusion, and absence of those factors which involve glare, and other harmful effects. From the standpoint of quantity the committee sets up the following recommended values of illumination for school interiors:

Location	*Foot Candles*
Class A — Sewing rooms, drafting rooms, art rooms, and rooms where fine detail work is to be done — on the work.....	15–10
Class B — Classrooms — on the desks and blackboards; study halls and libraries — on desks and tables; shops, manual arts, and vocational training, laboratories — on the work; gymnasia — main exercising floor, basketball, boxing, wrestling; playrooms, swimming pools.....	12–8
Class C — Auditoriums, assembly rooms, cafeterias, and other rooms in which pupils congregate for extended periods but not used for study	5–3
Class D — Recreation areas, locker rooms, corridors, stairs, passageways, toilets.....	4–2

Natural Lighting

The committee suggests that the greatest amount of daylight practicable should be provided in schoolrooms.

The leading organizations interested professionally in the betterment of hygienic conditions in schools have worked out a complete new code for standardizing school lighting. The most important standards are here presented.

—The Editor.

"In classrooms with the usual window area, the illumination will vary from a few hundred foot-candles, near the windows, to 10 foot-candles, or less, near the opposite wall, while the illumination out-of-doors, even on a cloudy day, may average from 500 to 1,500 foot-candles, or more.

"It will be realized, therefore, that when the highest daylight illumination practicable has been provided in a schoolroom, it is still far below that which exists under the open sky. To so construct and arrange the windows of a schoolroom as to give, on the desks, the greatest illumination practicable, with the best conditions for seeing, should be the object of the architect and illuminating engineer."

Classroom Windows

"The adequacy of the interior lighting bears a definite relation to that part of the sky which the windows face. In general, windows facing northeast, northwest, southeast, and southwest will receive more nearly equal amounts of sunlight than those facing the cardinal points of the compass. Where, because of the orientation of the school lot, such exposures are not available, it is desirable to face the windows of the classrooms east or west instead of north or south.

"Most children write with the right hand, hence it is considered desirable to place the windows to the left of the pupil to prevent shadows on the work when writing. For the same reason, windows should rarely be placed at the rear and never at the right. Mullions should be narrow to prevent the casting of shadows.

"To secure the maximum average illumination over the working surfaces, the window-glass area should be as large as structural and architectural limitations will permit. Experience indicates that the glass area should not be less than 18 per cent of the floor area for glass, starting 3 ft. above the floor, or 16 per cent for glass starting 4 ft. above the floor; but the best practice is to exceed this minimum value, particularly if a portion of the sky is obstructed by adjacent buildings."

Artificial Lighting

Practically no school building in the United States can be considered satisfactory without ample provisions for artificial illumination. The extension of the use of school buildings has been so general that evening uses are inevitable and lighting is an essential necessity. In discussing this problem, the committee writes:

"There are a number of requirements which must be met to assure good artificial lighting. Briefly stated, these are: sufficient wiring capacity, outlets so located as to secure good distribution of light, suitable glare-free lighting units, ample illumination for efficient study and safety, and systematic maintenance. As practically all modern illumination is by means of incandescent lamps, this discussion will apply primarily to them as a source of light, but other illuminating media may be used subject to similar conditions.

"General artificial lighting is not sufficient to give really good illumination on blackboards. It is, therefore, desirable to provide auxiliary outlets over any blackboards which are much used during hours of artificial lighting. These outlets should have a capacity of at least 1 watt per square foot of board.

"It is recommended that swimming pools be wired for underwater lighting.

TABLE III. Electrical Load to be Provided in School Wiring

	Watts per Square Foot
Class A — Sewing rooms, drafting rooms, art rooms, sight-saving classrooms, and rooms where fine detail work is to be done at present or in the future.....	5
Class B — Classrooms and study halls, libraries, shops, manual arts and vocational training, laboratories, gymnasia; main exercising floor, basketball, handball, boxing, wrestling, playrooms, swimming pools	3
Class C — Auditoriums, assembly rooms, cafeterias, and other rooms in which pupils congregate for extended periods but not used for study.....	1½
Class D — Recreation areas, locker rooms, corridors, stairs, passageways, toilets...	1

Location of Outlets

"Lighting outlets should be arranged to make possible as even a distribution as practicable. Current practice requires that the relation of maximum to minimum illumination on the work in rooms of Class A or B of Table III should in no case exceed 4 to 1. In general, lighting outlets are symmetrically arranged."

Lack of space prevents the inclusion of more of the interesting discussions of the report. The following rules are, however, of importance:

Minimum Illumination Values

"Illumination on the work or over the area shall be maintained during all periods of use at values not less than those stated herewith. Where the area used for work is not clearly evident, as for instance in an auditorium, the illumination may be measured on a horizontal plane 30 in. above the floor. However, where the area or work is clearly evident, as on desk tops or stair steps, the illumination shall be measured on such plane.

"The classification of a given room or area shall be determined by the type of work done and not by the name of the room."

	Foot-Candles
Class A — Sewing rooms, drafting rooms, art rooms, and rooms where fine detail work is to be done — on the work....	8
Class B — Classrooms, study halls, libraries, offices, shops, laboratories, and all rooms where classwork or study is done — on the work.....	5
Class C — Gymnasia; main exercising floor, basketball, handball, wrestling; playrooms, swimming pools.....	3
Class D — Auditoriums, assembly rooms, cafeterias, and other rooms in which pupils congregate for extended periods but not used for study.....	2
Class E — Recreation areas, locker rooms, corridors, stairs, passageways.....	1

"Class and study rooms with fixed seats shall have windows placed either to the left, or to the left and rear, of the pupils when seated, with no more than 50 per cent of the glass area to be placed at the rear.

"The bottom of the glass shall be at least 3 ft. above the floor, and the height from the floor to the top of the glass, plus 6 in., shall be not less than one half of the average width of the room.

"The total glass area shall be not less than 16 per cent of the floor area when the bottom of the glass is 4 ft. or more above the floor. The glass area shall be increased at the rate of 1 per cent for each 6 in. that the bottom of the glass extends below 4 ft. from the floor.

"Windows shall extend toward the rear of the room at least as far as the front of the last row of seats, and well toward the front of the room; the distance from the front wall to the window shall in no case be more than 8 ft.

Diffusion and Distribution of Light

"Lighting, whether natural or artificial, shall be such as to avoid glare, objectionable shadows, and extreme contrasts, and to provide a good distribution of light. In artificial lighting systems, lamps shall be so installed in regard to height, location, spacing, and glassware, reflectors, or other suitable accessories, as to accomplish these objects.

(Concluded on Page 74)

BAUHAUS SCHOOL, DESSAU, GERMANY, 1925–1926
Walter Gropius, Architect.

Three "Modern" School Buildings—An Appraisal

John W. Sahlstrom, Assistant in Educational Administration, Teachers College, Columbia University

Whenever a far-reaching innovation in school-building design makes its appearance, it is sure to be subjected to severe and, in some instances, unsympathetic criticism. Crystallized tastes and preferences tend to resist change, and a sentimental attachment to the traditional school forbids undue tampering with its architectural appearance. And with reference to its utilitarian features and arrangements, the tendency is to place confidence in experience rather than in experiment. If we pause to consider the changes that have already taken place in all phases of human life, we may gain a more tolerant attitude, and appraise more impartially the work of those who have dared to experiment.

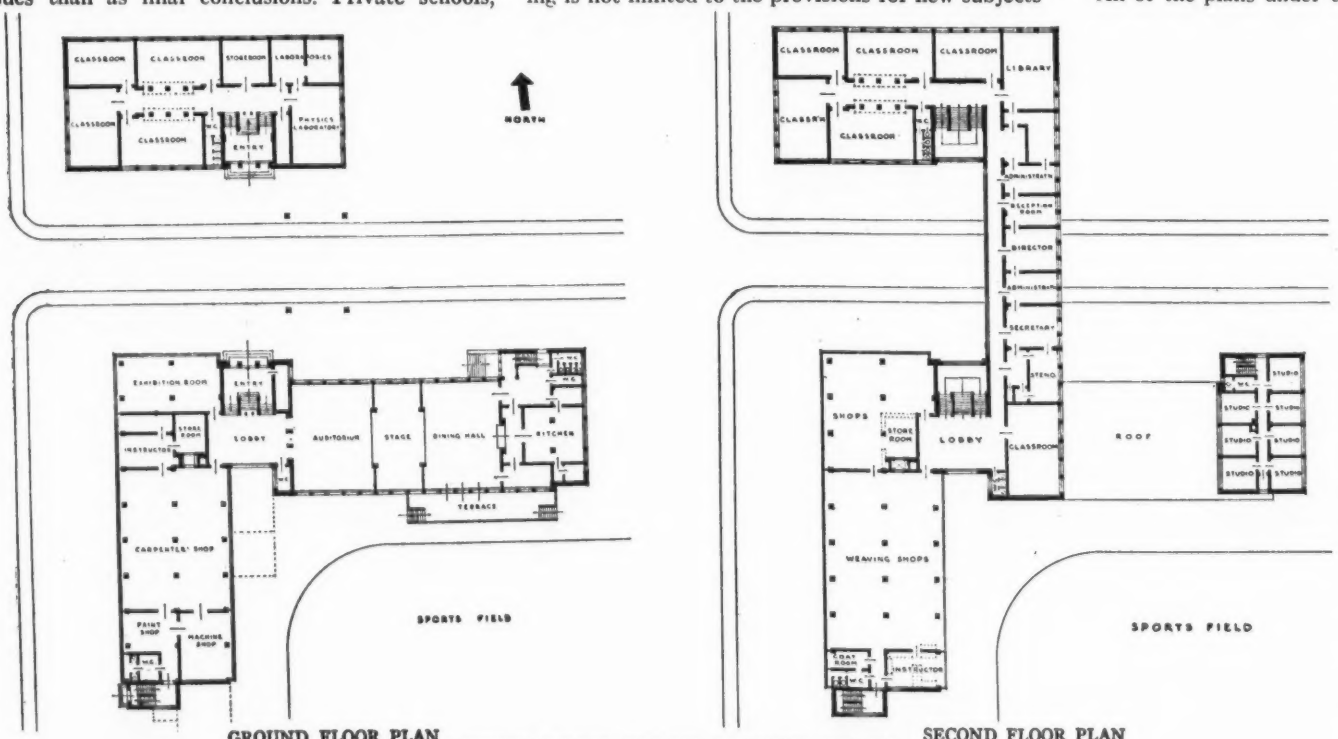
The purpose of this article is to present, briefly, some recent and notable departures from contemporary practice in school-building construction. The views expressed herein should be regarded more as issues than as final conclusions. Private schools, experimental schools operated by higher institutions of learning, and in isolated instances public schools under progressive administrations, may be characterized as the vanguards of the educational movement. The elements that control their advance are neither radical nor conservative, but tempered with moderate progressivism. At times progress has been fortuitous, with forces on the outside compelling the school to expand its offerings or modify its methods in conformity with social needs.

Wherever the change or progress may have had its origin, it was in many instances accompanied by a need for building adaptation. When domestic science, after being introduced by outside organizations, was established in the curriculum, special rooms and equipment were needed. In a similar way the health, guidance, and other programs called for special provisions in the school plant. Change in the physical characteristics of the school building is not limited to the provisions for new subjects or activities. Existing elements of the school plant are constantly yielding to experimental evidence. A decade ago, school-building standards prescribed 30 cubic feet of air supply per pupil per minute.[1] Standards for air supply today are on an entirely different basis which eliminates the need for the extensive installations of the past.[2]

Efforts to incorporate desirable facilities into the modern school building have been expressed on the one extreme by ultraconservatism and on the other extreme by more radical tendencies. The illustrations which accompany this text are examples of school architecture and planning which may well be considered to represent the latter. This should by no means be construed as a criticism. All too often there seems to be a disposition in some quarters to pronounce final judgment on a project simply because it has been labeled as radical or progressive.

All of the plans under consideration, and models of the Ring Plan School and the Bauhaus School at Dessau, Germany, were exhibited in New York City in the spring of 1932 by the Museum of Modern Art.

Private initiative, responsible only to itself or to a small like-minded group, can afford to experiment in building design and arrangement. Whenever the taxpayer's interest is involved, however, as it is in the erection of public schools, the architect must confine the play of his imag-



GROUND FLOOR PLAN — SECOND FLOOR PLAN

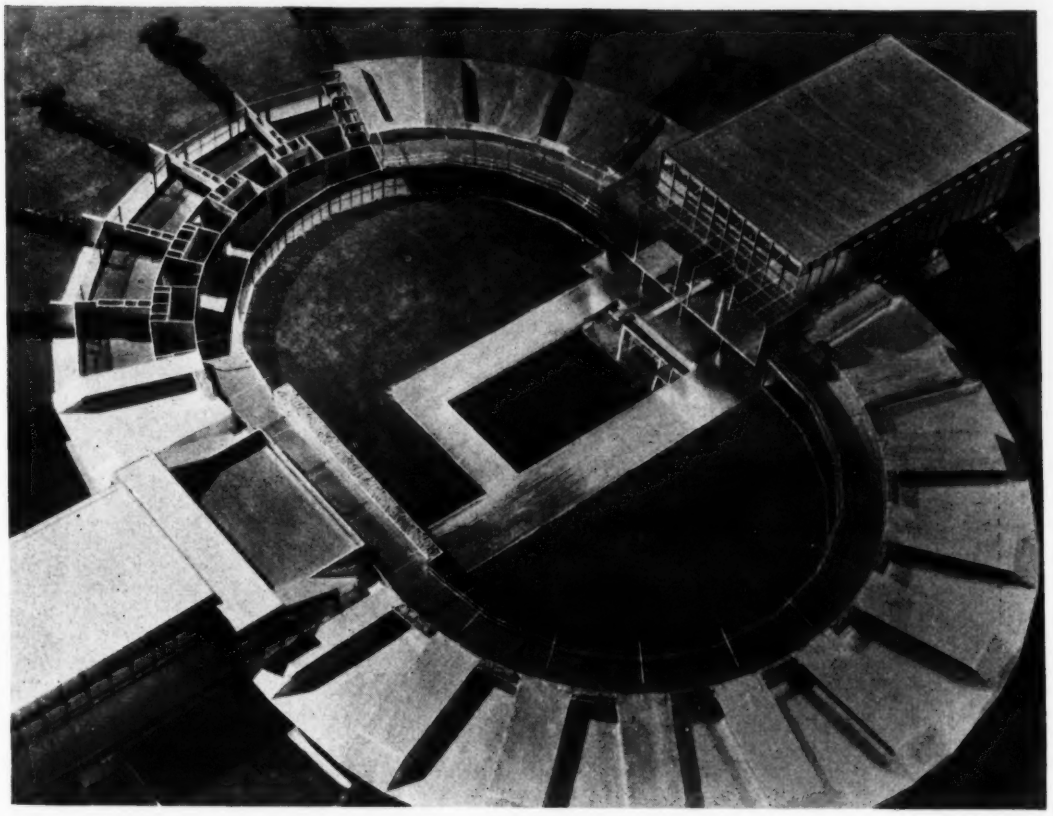
BAUHAUS SCHOOL, DESSAU, GERMANY, 1925–1926
Walter Gropius, Architect.

[1]Strayer, G. D. and Engelhardt, N. L., *Standards for High School Buildings* (New York: Teachers College, Columbia University, 1924).

[2]Engelhardt, N. L., *Standards for Junior High School Buildings* (New York: Bureau of Publications, Teachers College, Columbia University, 1932).

ination to reasonably conventional designs. The public-school exterior has always possessed an individuality of appearance that has been peculiarly its own. Pleasing variations have been introduced occasionally by employing artistic brick- and stonework designs. Small turrets, towers, and well-balanced wings have tended to produce a modified appearance. On the whole, however, it may be said of the American public schools, "by their exteriors you may know them."

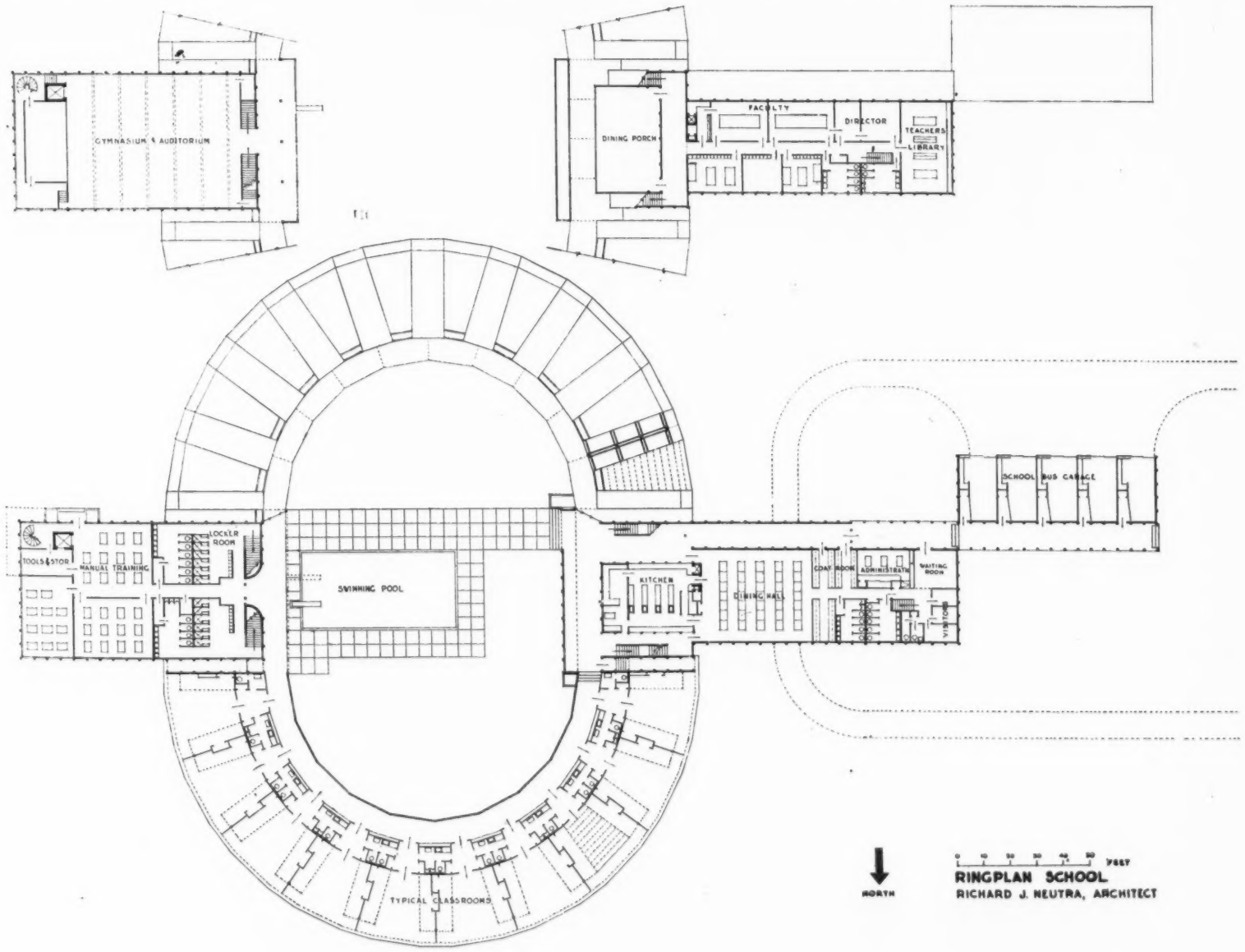
The casual observer would fail to recognize familiar school-building design in the rather severe lines, monotonous expanse of glass area, and the flat unbroken surface of the Bauhaus and the Hessian Hills schools. He would be still further puzzled in his attempt to identify the Ring Plan School. The critic of the two former schools objects on the grounds that their elevations resemble structures commonly used to house entirely different types of occupancies, such as manufacturing, assembling, and commerce. His sense of the appropriate is offended — the dignity of the cause of education has suffered. That the artist who conceived the Bauhaus School was quite aware of this criticism is evidenced by his attempt to introduce variations by painting in the separations between windows. It is quite clear that the architects were compelled to sacrifice elements of artistry in the exteriors in order to attain increased amounts of air and light. Utility will finally dictate the acceptability of extensive glass surfaces and the elimination of the customary piers and panels of decorative masonry. If more light and more air is needed, our esthetic sense will soon become accustomed to, and find satisfaction in, the architectural expression which best achieves the desired result. But is there reliable evidence that indicates the need for more light? Proponents claim that the progressive school with its informal methods makes a very special demand for more light than present-day standards specify as sufficient.

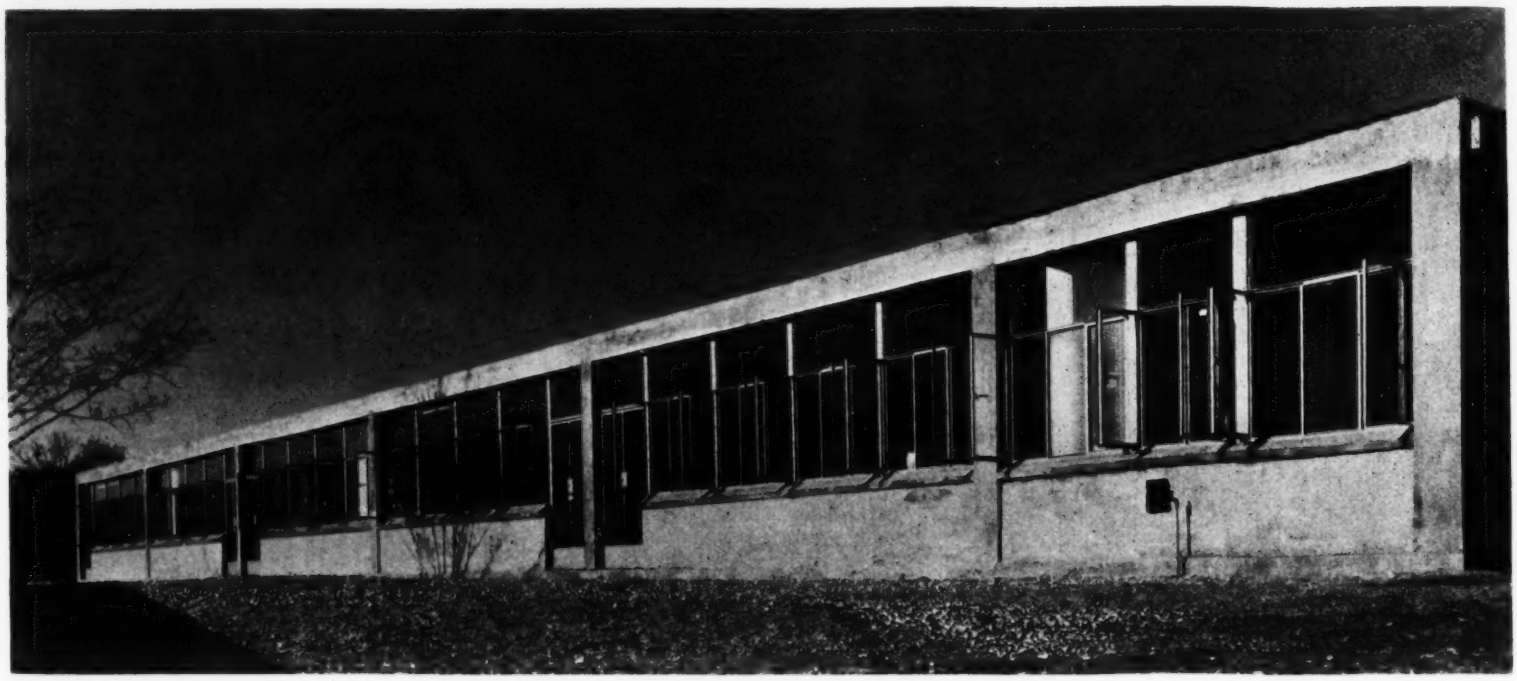


PROJECT FOR RINGPLAN SCHOOL
Richard J. Neutra, Architect.

"If we may assume, to begin with, that free seating will be universally accepted, it becomes necessary to provide daylight illumination suitable to a varied orientation of writing surfaces. The customary practice of having all the windows on the left side of all students, in order to avoid shadows of the hand on the writing surface, obviously fails when there ceases to be a common left side. Consequently, a system of diffused lighting is essential — soft, but abundant light, evenly distributed over a large area, so that shadows are eliminated altogether."[3]

[3]Ain, Gregory, "Progressive Architecture for the Progressive School," *Progressive Education*, 9:195–202 March, 1932.





HESSIAN HILLS SCHOOL, CROTON-ON-HUDSON, NEW YORK, 1931
Howe and Lescaze, Architects.

Abundance of windows on one side of the room fails to eliminate objectionable shadows; and proper diffusion of natural light is not satisfactorily attained by any known method of reflection. Recourse must be had to overhead or bilateral lighting until some genius presents a plan that will combine the essential features of distributing light evenly on all surfaces without the requirement of skylight or bilateral lighting. Other practical problems which must be met in this connection have to do with heating and structural stability.

The Ring Plan School

So far as the writer knows, the Ring Plan School has not as yet been put to the test through actual construction and use. The Museum informs us that it was worked out in connection with a general project meaningfully termed "Rush City Reformed." The critic writing in *Modern Architecture* admits that the plan is an ideal one, since current real-estate conditions would hardly permit the use of so large an area for a school in a region densely populated enough to provide the children. This is a minor criticism and would apply only to metropolitan centers. Authorities are in substantial agreement that no large elementary school should be located on a site of less than five acres. The size of the site, obviously, is not greater than is required by established standards. The structural features which produce its outdoor characteristics are the very features which would prohibit its use in climates of varying temperatures and weather conditions. The one-story elevation permits diffused overhead lighting to supplement the light from the glass walls on the terrace side of the classrooms, but imposes limitations on the practical utilization of the site. Even under such uniform climatic conditions as are found in California, where the plan was conceived, there would be need for more roof and wall insulation against the direct rays of the sun in the late spring and early fall, and against the inclement weather of the winter months. The possibilities of the satisfactory utilization of the open area within the oval is dependent upon the purpose of this reservation. Its dimensions are not suitable to typical playground activities. If the intent is to attain artistic lawn or landscape effect, or to secure space for sun bathing and water sports in connection with the pool, its inclusion would be justified to the extent that these provisions contribute to the educational program.

The criticism of undue decentralization for purposes of administration is based upon the viewpoint of functional articulation which requires closer and more intimate means of contact between general and special service rooms and the classrooms. The plan undoubtedly assumes a general scheme of relatively independent classrooms, with individual toilets and wardrobes, and separate means of exit. The principle of functional distribution of facilities under which the plan is justly criticized, is fundamental to current policies and practices in administra-

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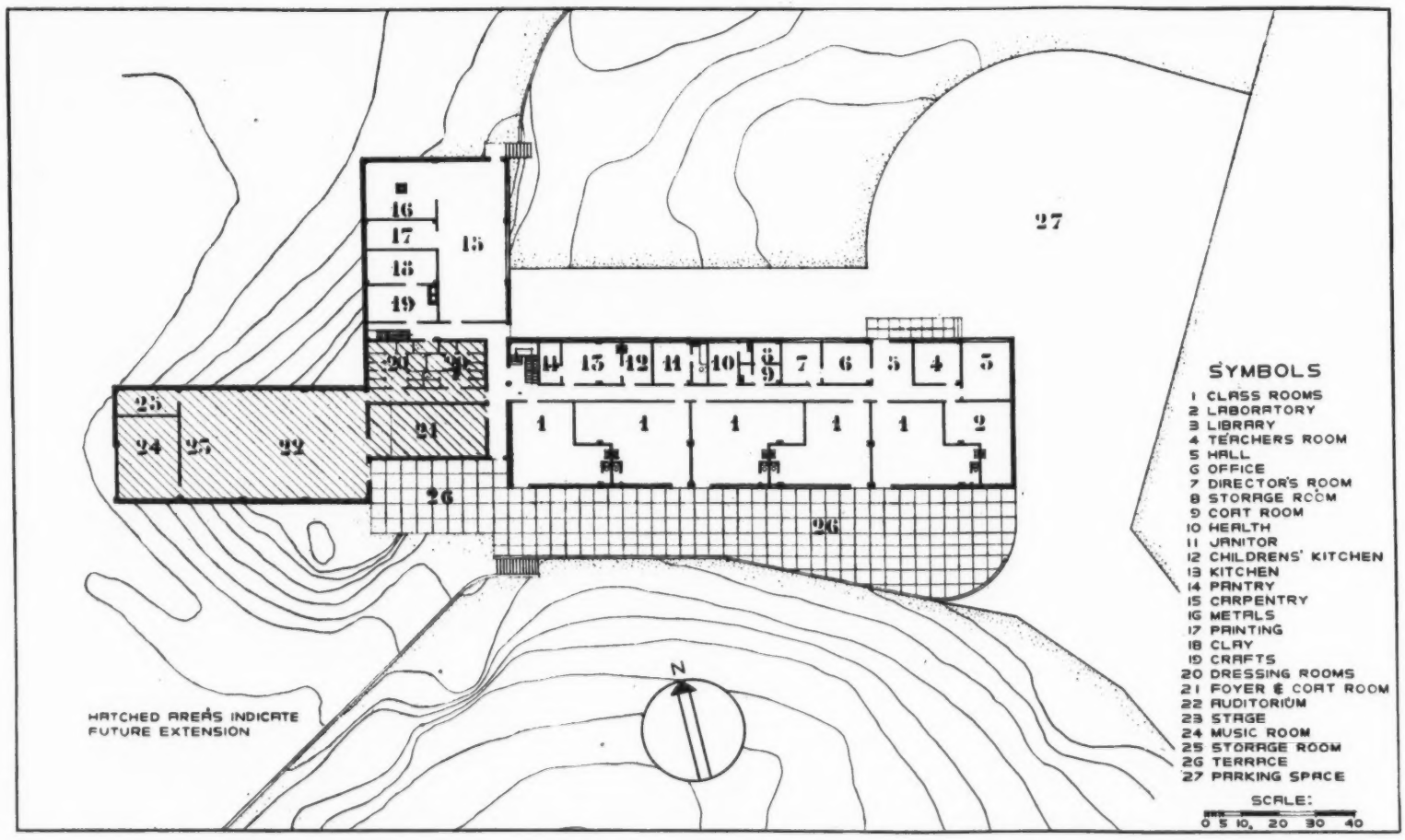


HESSIAN HILLS SCHOOL, CROTON-ON-HUDSON, NEW YORK
Howe and Lescaze, Architects.

Modernizing Old Schoolrooms to Meet Present Needs

Clara Flemington, Director of Home Economics, and
Charles Dalthorp, Superintendent of Schools, Aberdeen, South Dakota

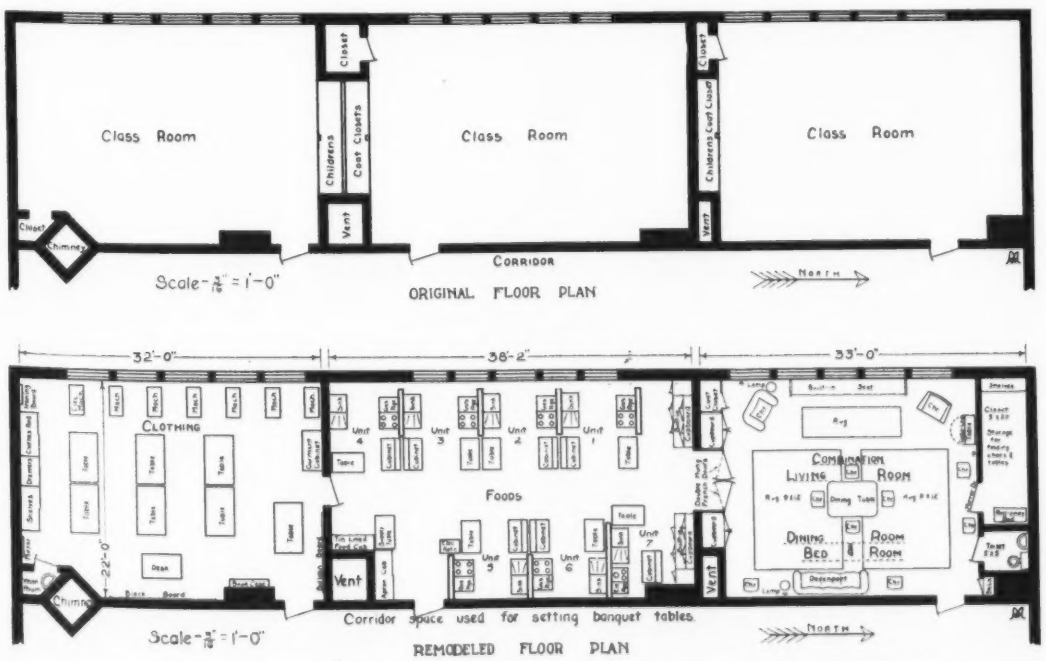
School administrators and executives are continually confronted with the problems of remodeling schoolrooms and school buildings and replacing educational equipment to keep pace with progressive ideals and practices. No branch of modern education has made more meteoric advances during the past few years than has home economics. The schools have striven to keep pace with the rapid changes in the social and economic world, which have so completely revolutionized family life in the American home. Their struggles for progress and very existence have often been discouraging and at times futile because of assertions by some uninformed patrons and even school administrators that the homemaking courses offered in the public schools are not functional, that they are duplicating and usurping the training that should be given in the home. Occasionally the statement is even made that the courses are designed for the backward pupils, and they, as a consequence, are the only beneficiaries. These statements are made in the face of the realization that over 90 per cent of the girls, who graduate from high school, will enter homemaking as a vocation.

More often, boards of education and school administrators are sympathetic with the modern homemaking courses, but have failed to make progress because of lack of space or policies requiring rigid and sometimes niggardly economy. They indifferently drift along year after year with inadequate room and obsolete equipment, teaching the traditional cooking and sewing courses, trusting against better judgment that some necromantic fairy will provide teachers with enough personal magnetism and ability to retain interest and produce tolerable results. During these years, enrollments dwindle; community and pupil interest in the work is at low ebb: and the results of teaching are unsatisfactory and expensive.

Aberdeen had a board of education sympathetic with modern homemaking courses, but unable to keep pace with the present standards in equipment and the more liberal ideas because of inadequate space for enlargement and development. The home-economics department was included as a part of the original high-school building erected in 1910. It consisted of two rooms; one served as a cooking room and the other as a sewing room. The cooking room, arranged with a hollow square and equipped with small gas plates each designed to serve one girl, represented the best thought in planning home-economics rooms twenty years ago. One end of the room provided space for an antiquated gas range and ovens, an old-fashioned kitchen sink, and a first-aid cabinet; storage cupboards and an ice box adorned the other end of the room. The sewing room was an ordinary small classroom furnished with pine tables, a movable storage cupboard, and foot-power sewing machines. The woodwork was finished with a dark stain, making the rooms unattractive and almost gruesome in appearance. The only marks of beauty visible in connection with either room were "Cooking" and "Sewing" brilliantly gilded on the outside of the doors.

SEVEN UNIT KITCHENS EACH PROVIDE FOR GROUPS OF FROM ONE TO FOUR GIRLS

FOODS ROOM IN OLD DEPARTMENT EQUIPPED WITH HOLLOW SQUARE TABLE ARRANGEMENT TAKEN IN 1922



FLOOR PLANS OF THE ORIGINAL UNIT AND OF CLASSROOMS, AND OF THE REMODELED HOME ECONOMICS SUITE

An expansion program inaugurated for the senior high school in the summer of 1930 released a grade-school building located one hundred yards west of the high school for senior-high-school purposes. Three ordinary grade classrooms were reserved on the second floor of this building to be remodeled into a suite for homemaking courses for high-school girls.

Instead of giving the remodeling and equipment problem to an architect, the board of education asked the director of home economics to draw preliminary plans and complete specifications for equipment and furnishings, together with estimated costs. As her work progressed, she conferred frequently with the school architect and superintendent relative to general policies and details. This remodeling was completed during the summer of 1930 and was ready for occupancy at the opening of school in the fall.

The girls enrolled in the home-economics classes had a definite part in planning the new department. The combination homemaking room was bare at the opening of school. The class of seniors drew plans of the room, studied the art principles involved in furnishing, visited local stores, and actually selected, purchased, and placed the rugs, furniture, draperies, pictures, dishes, linen, bedding, and accessories within the budget allowed by the board of education. The furniture and equipment was purchased locally, giving sight selection and insuring a variation from the stilted science-room-laboratory atmosphere so frequently emulated in home-economics rooms. This pupil participation not only has proved valuable as an interesting and educational problem, but also has developed a sense of ownership which has been evidenced in good care of, and pride in, the rooms. The girls are happy and satisfied with their job, which was completed by the end of the school year 1931.

ONE OF THE SEVEN UNIT KITCHENS IN THE FOODS ROOM

CLASS IN CLOTHING SELECTION AND CONSTRUCTION

In accordance with growing tendencies throughout the country, Aberdeen is offering many phases of home training. The school aims to meet the needs of the girl in her present home life. Each year the course in home economics is developed on the unit plan, thus making it possible to alternate classes in the rooms during each semester. The three rooms of the department serve three classes meeting at the same hour. This arrangement provides for growth.

The combination room planned for this department has many possibilities. At one time it is a living room; at another, a dining room; a screen and glide-away bed stored in an adjoining closet provide a bedroom, with toilet facilities near. The rugs may be rolled and stored; small folding tables and folding chairs immediately transform the room into a study or recitation center. In this way the space is used to better advantage than if it had been cut into small apartment rooms. The room provides for lessons in house care and home planning, lessons which are often lacking in home-economics courses.

In addition to the use made of the homemaking room by the home-economics department, it is not uncommon to find a parent-teacher-association group, an adult homemaking class, a teachers' committee, a group of elementary-school teachers, the primary council, or a teachers' social gathering enjoying the room for some special activity.

In planning this department the important place of social relationships in the high school was recognized. The combination homemaking room offers opportunities for many types of social contacts for both boys and girls. They have the privilege of entertaining each other, their parents, high-school teachers, and friends in a homelike atmosphere.

There is a feeling of satisfaction on the part of school authorities viewing the completed project. Since the completion of the new rooms there has been a steady increase in the enrollment in the classes in homemaking. Without special seeking, the number of girls taking the course has increased 61 per cent. This may be attributed to the improved facilities for offering the subject.

Briefly stated, this problem in remodeling was successful for the following reasons:

It has interested more girls in homemaking courses.

It has decreased teaching costs due to facilities for handling larger classes.

It has provided facilities which are in keeping with modern times.

It has provided a social center for the whole school.

It has increased respect for homemaking education in the community and dignified it in the minds of the entire high-school body.

FOLDING TABLES AND CHAIRS TRANSFORM THE COMBINATION HOMEMAKING ROOM INTO A STUDY OR RECITATION CENTER

The Relation of Teacher Offices to High-School Building Capacity and Utilization

Willard S. Ford, School of Education, University of Southern California

Teacher offices are inadequate. The present practice of providing teacher offices in high schools is very limited. Where offices are provided they are usually for the teachers in special fields and in many cases these provisions are unsatisfactory. In a number of instances general workrooms have been provided for the academic teachers, and these have found their most satisfactory use as places for the preparation of class materials because of the equipment available in the room. Such rooms have not been a success either as conference rooms for pupil-teacher conferences or for teacher study and preparation. Hansen found from a study of the published plans in the SCHOOL BOARD JOURNAL that while limited provision of teachers' offices was made in a small proportion of cases, no high-school building had made adequate provision.[1]

This policy is quite in contrast to the policy in higher institutions. In the majority of institutions individual offices are provided for the staff. This has probably resulted from the emphasis on research in the higher institutions which necessitates a private office, the importance of student conferences, the larger accumulation of professional materials and the differences in class organization and scheduling. In the face of these differences the advantages of the individual offices for college teachers seem equally applicable to high-school instructors. This is increasingly true in the modern high school where the nature of the work and the amount of material are comparable with that of the college of a generation ago.

Assignment of teachers to rooms. A number of practices are current in the assignment of teachers to classrooms. A frequent policy has been to give a permanent assignment to a particular room which the teacher comes to consider strictly her own. In this case the room serves as an office as well as a classroom and the teacher makes the room the sole headquarters. This provides an office some 22 by 30 feet in size for the teacher to use during the nonteaching periods.

A second method of assigning teachers and one closely related to the first, is to assign teachers according to the character of the classroom and the subject taught. A teacher of shop subjects would expect to move from one shop to another if he had more than one shop subject. Where the majority of teachers have classes in one subject-field this becomes a definite individual room assignment, and is subject to the same criticism as the former procedure.

A method which is growing in use because of the necessity for increased efficiency is to make assignments according to the capacity and availability of the rooms. By this plan the small class is assigned to the small room, and special rooms may be used for academic classes when available. Some such plan is necessary if the administration is to approach a 100-per-cent room utilization. To achieve increased utilization, the teachers are forced to give up their classroom during their vacant periods. In order to use the teacher's time effectively during these periods, some housing provision must be made.

Assignment policies and building capacity. The use of classrooms for teacher offices reduces the capacity of a building in the ratio of the average number of vacant periods to the number of periods in the school day. An illustration will possibly make this more clear.

Conditions

Number of classrooms	34
Average class size	30
Scheduled class periods	7
Average classes per teacher	5
Average classes per student	5

[1]Hansen, Mary A., "A Study of the Provisions of Teacher Unit Offices." Unpublished thesis, University of Southern California.

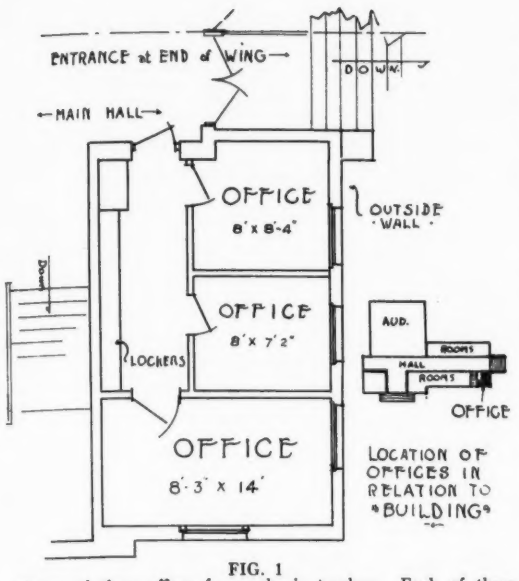


FIG. 1
Group of three offices for academic teachers. Each of these offices is occupied continuously during the day. The secondary corridor becomes a convenient locker room.

Under the conditions stated, the number of available pupil stations is 30 times 34, or 1,020. Assuming that pupils not in class are cared for in study halls, the total capacity of the plant would be raised to 1,428 if all classrooms were used each period. If the teachers each have two nonteaching periods when they use the rooms as offices, two sevenths of the capacity is utilized for this purpose. The usable pupil classroom capacity is then reduced to 729 per period. The total pupil capacity, including study halls, would be reduced to 1,020 pupils. The change of policy from the use of classrooms for offices to one of continuous use would in this case increase the capacity by 40 per cent. It would require 13 additional classrooms to provide the same capacity on a 5/7 program as is available with a complete use of the plant indicated.

Methods of providing teacher offices. The most frequent method of providing teacher offices is by the use of classrooms. The inefficiency of this plan is apparent. To provide general workrooms fails to provide the desirable privacy for conference, quiet for study, or a personal place for keeping materials and personal effects. A number of schools have departmental offices which are largely the headquarters of the department head and excellent so far as they go. In this case no provision is made for the teachers.

It is possible to furnish individual teacher offices without excessive cost if they are properly planned and teachers are scheduled to the offices as they are to the classrooms. In the example given above, each teacher would need an office assignment two periods a day and one office will care for three teachers in the seven periods. Such a plan will necessitate careful scheduling and proper planning of the offices. To do this requires the solution of some architectural and administrative problems.

Architectural problems involved. Offices of proper size and shape are difficult to plan in a school classroom unit. In the usual classroom unit the width from corridor to outside wall is approximately 22 to 24 feet. To have a series of two or three offices in this width provides a problem of lighting, heating, and ventilating as only one would be on the outside wall and only one next to the corridor. If space were used as a single office it would either be much larger than necessary or would be very long and narrow.

Arrangement of a building to give a pleasing outside appearance requires regular divisions to give proper window spacing. To place an office in such a unit is difficult. It therefore becomes a problem of placement which will not destroy the symmetry of the building and will permit of location convenient for the teacher. While these problems are difficult, they may be solved by careful planning.

Offices in the Monrovia High School. An example of satisfactory provision of teacher offices is found in the Monrovia-Arcadia-Duarte High School located at Monrovia, California.[2] Because of the desire to secure a maximum of usable capacity for the money available, the architects were requested to provide six academic teacher offices and offices for each of the special departments. The sketches presented will show how the problems were developed.

Three of the academic teacher offices are shown in Figure 1. In order to secure satisfactory light and ventilation the offices were placed at the end of the unit. A secondary corridor served the offices. Lockers were furnished in this corridor so that it became the teachers' headquarters. In each office, space was provided for a teacher desk and chair, and chair for a visitor. Shelving and vertical files for materials were provided for each of the three teachers assigned to the room. The largest office has two desks or was assigned to a department head where more space was desirable. By providing an entrance from the stair landing it was possible to have a second series of offices on a mezzanine floor since the ceiling height did not require a full story.

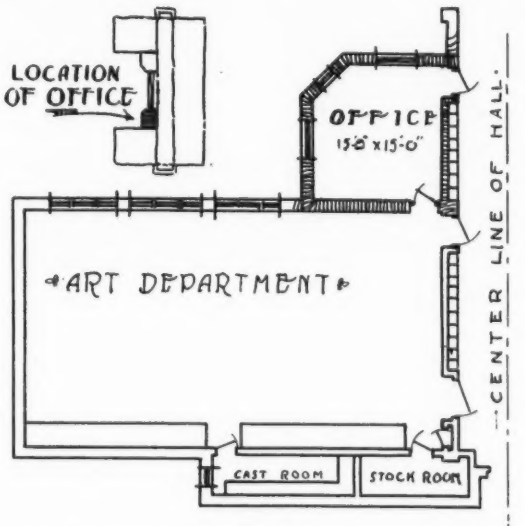


FIG. 4
Art Department Office. It occupies an angle between wings of the building.

The music rooms were placed across a corridor from the auditorium stage. The music office was placed between the two music rooms. This room serves as a music library as well as an office which places the valuable materials under good supervision. This arrangement is shown in Figure 2.

A typical problem was presented in planning the office for the domestic-science department, given in

[2]Austin and Ashley, Architects, Willard S. Ford and Osman R. Hull, Educational Consultants.

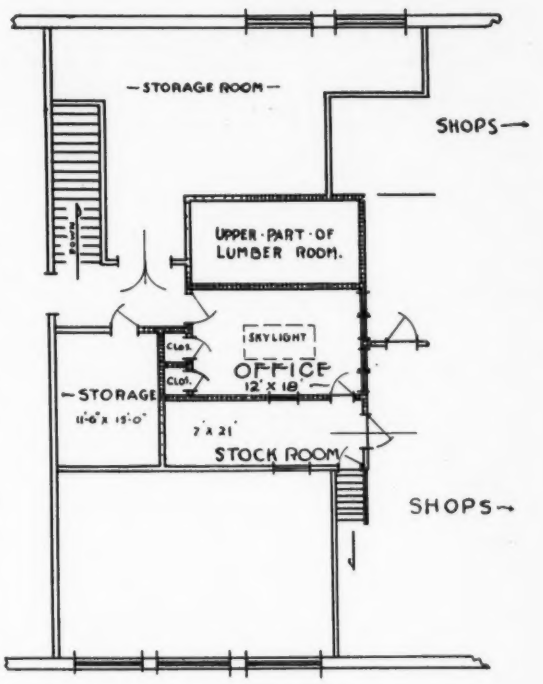


FIG. 5
The shop office occupies a strategic position from which two shops may be observed by the teacher and utilizes what would otherwise be waste space.

Figure 3. Entrance to the office from the main corridor was desirable to prevent disturbance of the class. Proper shape and size were secured by using the inside area for stockroom and fitting room.

The art office was favorably located and served as a display room as well as an office. The irregular shape of the building unit made this possible and provided excellent shade and light.

The placement of the office to secure easy supervision of the department is illustrated in Figure 5. In the shop unit the office was placed on a second floor. Windows in the office gave full view of both the woodshop and metal shop. The office was conveniently located for the drawing room which was on the second floor as well as to the shops.

Offices for the science units were secured by placing them between the two laboratories of a given type and using the inside space as a supply room. This provided the office with proper light and made both offices and storeroom available for the two laboratories. Usual provision was made for the physical-education teachers in those departments.

Building savings by providing offices. The building described has office provisions for every teacher. It is possible with good scheduling to use every period of the day. The required capacity was secured with a net saving of six classrooms had it been the policy to use classrooms as teacher offices during vacant periods. While the forty thousand dollars saved is a significant sum, the important advantage is the improved administration of the school and the more efficient use of teacher time. It appears that the plan of providing individual teacher offices might well be followed in the planning of high-school buildings.

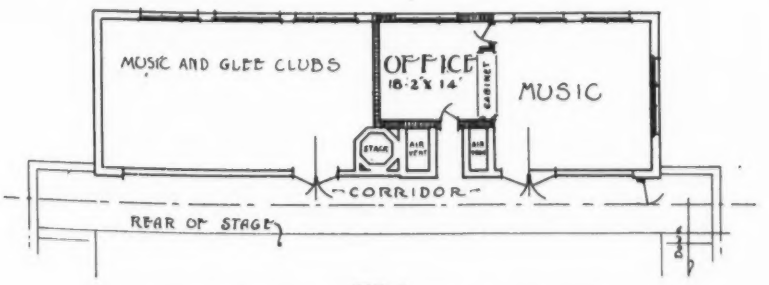


FIG. 2
Office for the music teachers. It serves as a music library.

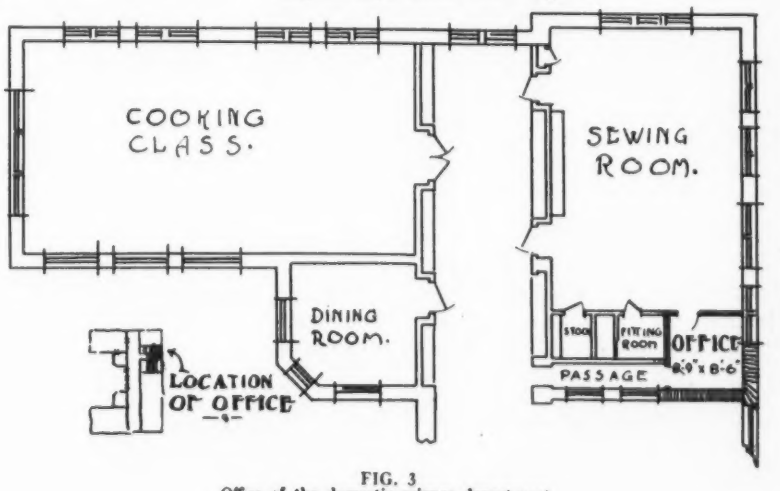


FIG. 3
Office of the domestic science department.

THE AMERICAN
School Board Journal

EDITORS:

WM. GEO. BRUCE WM. C. BRUCE

The Credit of American Municipalities

THE credit ability of the American municipalities has in recent months received careful examination at the hands of financial experts. Significant facts have been gathered, facts which vitally concern the school interests as well as other departments of local government.

In determining upon the credit of American cities it is estimated that the bonded indebtedness of cities having a population of 30,000 and over is about 75 per cent of the municipal indebtedness of the country. All told, there are something like 150,000 taxing units. Most of the 48 states which have come into consideration are practically free from default on the payment of interest on bond obligations which aggregates the sum of $2,400,000,000.

A report made by the Investment Bankers Association of America says: "Out of the 309 cities in this class, 11, or 3.5 per cent, are reported to be in default. Six of the overlapping school districts are also reported in default. These 309 cities and their school districts have a gross bonded debt estimated at approximately $8,400,000,000. The 11 cities and 6 school districts reported in default have a gross bonded debt estimated at approximately $153,000,000, or 1.8 per cent of the total debt of the cities in this class."

The report goes on to say that the number of defaults in counties, cities, villages, and school districts are as follows: 11 states, none; 17 states, from 1 to 5; 5 states, from 6 to 10; 15 states, more than 10. The experts add:

"With a perfect record as to state obligations, only 11 cities and 6 school districts representing 1.8 per cent total indebtedness of cities and school districts in excess of 30,000 population in default, and only 42 per cent of the states in the union reporting more than 5 defaults in the group canvassed, we believe that municipal credit is still entitled to rank as the premier investment medium of the country, next to United States Government obligation."

This statement is most gratifying in that it notes the credit ability of the average unit of government, and that school bonds issued now and in future will, provided they are held within the debt limit, be regarded as good investments.

There is reason to believe that a number of state legislatures will not only consider tax limitations but debt limitations as well. While these are now fixed in all states the tendency will be to reduce rather than increase them. This will enhance the security of the bonds to be issued under the new limitations which are likely to be fixed.

America's School-Building Needs

It is one of the contradictions of American life that school buildings are erected most freely and in largest number during periods of prosperity when building costs are highest and when the actual rate of increase in pupil enrollment is low. School construction activities are at the lowest ebb when hard times hit us and when there are large rises in the numbers of pupils, especially in the advanced classes of the high school. A contradictory relation of schoolhouse construction to interest rates for bonds is not so clear, but in general it is true that the voters approve school projects when they are best able to pay the taxes even though the conditions of ultimate cost are not favorable and present needs are not clear.

The present school-building difficulties will not be without value to the schools. It is clear that school buildings now under way will be better and more economical because every project is receiving very much closer consideration from the standpoint of cost, need, and service. The new school building of 1933 and of succeeding years will embody distinct marks growing out of the consideration given to such important elements as the following:

(1) Careful surveys of educational needs, population, and enrollment trends, and actual classroom space needs; (2) studies of ultimate financing costs for the purpose of adapting the method in each case to the situation and of obtaining true economy; (3) closer studies of educational programs and adjustments of the same in view of a revision of the underlying philosophy to new needs and to a restatement of original principles; (4) careful studies of all space requirements from the standpoint of eliminating wasteful room-layouts and excessive unit "standards;" (5) studies for reducing provisions for safety and service which have been commercially influenced and are in excess of true needs; (6) close evaluations of new materials without reference to precedents and preferences carried down from the wasteful boom years of the middle "twenties;" (7) studies of architectural design in which old forms give way to true expressions of the function of school buildings and beauty is developed from the inherent character of materials and forms.

School boards who are acting at present to meet their school-building needs are following a policy which is in harmony with sound administrative procedure. School buildings financed and planned in accordance with the seven points discussed above will be more effective educationally and economically than any which can be erected in future years of renewed prosperity. The cost of construction is today at the lowest point in more than a generation. The quality and speed of construction are also at a new high point of advantage to the public owner. In many communities, the present prospective tax ability of the school district is distinctly favorable so that financing can proceed at a minimum cost.

All in all, school-accommodation needs deserve to be studied in view of fundamental needs and present opportunities. The present school plant should not be allowed to deterioriate by a lack of prompt repairs and a continued program of upkeep. Every reasonable need should be looked into and met so that the wild rush of school building in the years 1921 to 1928 at extravagant prices may not be repeated.

Prospective School Legislation

THE legislative bodies in the several states will soon convene to make new laws and to amend old laws. The educational interests have in many instances expressed their plans through resolutions adopted by state educational associations, and state superintendents are ready to go forward with definite recommendations. It is evident from the expressions which have become public that the discussion will center, in the main, upon the problems of school finance. The pressure to reduce the tax burden will be met by the urgency to maintain standards of efficiency in the educational service.

The trend will be in the direction of greater economy in government expenditures. The lawmakers who represent the taxpaying constituency will yield to a reduction in budgets rather than to increases. The job of the educator will be to resist such reductions as may prove harmful to the cause of education and which may, on the whole, be deemed unnecessary.

The question of taxation in its general aspects will be subjected to exacting scrutiny, and the discovery of new sources of revenue will be tested in the light of practical expediency and common equity.

It is here where the educator who champions an adequate support for the schools must exert his best efforts. He must not only know where the dollar is most needed and how to spend it wisely, but he must also familiarize himself with the fundamentals of taxation. More than that, he must have some knowledge of the tried and tested methods of exacting tax tributes — methods which are equitable and which yield the desired revenue. In other words, he must be clear on any new tax proposal in the light of past experiment and experience. It follows, too, that the demands of the educational interests must be weighed and measured in the light of the tax

ability of community and state as well as in the light of the legitimate needs of other agencies of government.

The legislator who is desirous of serving his constituency to the best of his ability may willingly listen to the clamor for lower costs in government, but he will also be open for suggestions that will, on the one hand, enable reductions, and on the other, maintain acceptable standards of efficiency. The educator must stand ready to deal with the problem in its larger aspects, contemplate all the contingencies involved, and counsel a course of action that in the light of a complicated situation is at once clear, sane, and sensible.

Wisdom of Calm and Judicious Administration

IT IS not unreasonable to hold that in a time of economic readjustment which is now going on throughout an entire country, the vision and judgment of the school administrator is put to a severe test. Every community has its financial problems, some of which are serious and others which are only minor and trivial, and some of which enter the field of school administration.

The school costs are in the public eye and mind, and naturally come under careful scrutiny. The assumption must be that the judicious administrator is alive to the situation which confronts him and that he solves his problems in a calm and judicious manner.

Some of the contentions of the taxpaying public, however, are not founded either in reason and fact, but are simply the outgrowth of a narrow and envious attitude. The man who finds his income materially reduced is inclined to make comparisons with his neighbor whose income is unimpaired. He is apt to look in the direction of the school people and hold that they enjoy easy hours and good pay. Hence, his criticism.

A correspondent writes us saying: "We are exposed to the enviousness of people in the community toward teachers and school heads. Shall we go down to their level, or ignore them?"

The answer to the statement and the question appended thereto must be that the school authorities cannot be disturbed by backyard gossip and small-fry jealousies. They must rise above trivial contention and controversy. Unwarranted criticism is usually merely local and incidental.

The business of the schools is vital to the social order and an imperative essential to the stability and perpetuity of the nation. The school authorities must hold with fidelity and firmness to the task in hand. Time and the return of a normal day will justify such a course of action.

Importance of Complete School Records

A JUDGE in a recent Colorado court action found it timely to suggest for the benefit of all secretaries of boards of education in the state, the importance of accurate and complete records of board proceedings. An important case came up to him for adjudication. The records of the school-board proceedings had been written several days after the meeting and proved to be both inaccurate and incomplete.

The court stated that "school boards should find time to go over the minutes of each meeting, make such corrections and additions as may be necessary, and either approve or disapprove them." The court added that the business of a school-board member is a thankless one for which there is no monetary compensation, but its deliberations must, nevertheless, be thorough and its records carefully and correctly made.

The importance of this caution is best appreciated when litigation arises, or someone challenges this or that procedure engaged in by the school authorities. A case brought in court invariably hinges upon the records. These must guide in determining the question at issue.

Those who have been in constant touch with the SCHOOL BOARD JOURNAL have noted in its columns from time to time editorials touching upon the question of records and the importance of reducing the proceedings of the board of education to writing.

Several excellent books have been published within the year discussing in detail the manner and method of keeping school-board records, and their importance in case of litigation which is apt to arise with unexpected suddenness. The school official intrusted with the minutes of school-board meetings is informed on all the contingencies likely to arise.

The Colorado case simply verifies the caution that has so frequently been expressed; namely, that the minutes of the proceedings of a board of education should be both correct as to the deliberations entered into and should be complete in point of record.

Shall the Teaching Profession Submit to Salary Reductions?

HERE is a timely question. It has recently been asked many times throughout the country. The answer made by those immediately concerned in the same is in the negative. The teaching profession is practically of one mind that, as a matter of equity and right, it must resist all attempts at salary reductions. The arguments set forth against a change, in the main are, reasonable and sound. They proceed from the thought that the service rendered is worth the price being paid for it.

The taxpayer answers the question in the affirmative. He argues that, since the cost of living has come down, the prevailing wage must come down, and that the teaching profession must share with the rest of mankind in the economic dislocation which afflicts the whole world.

The answer finally lies with the school authorities. They may listen patiently to the arguments of the teaching profession on the one hand, and to the pleadings of the taxpayer on the other. But the budget rises before them somewhat like a mountain that somehow must be crossed. In other words, the budget must not only be squared with the imperative needs of the school system but must also be adjusted in the light of the tax ability of the community.

The educators of the land have presented their case in irrefutable argumentation and reasoning. The professional workers, as a whole, have never in the past been overpaid, and in the face of the increased purchasing power of the dollar of today are not now being overpaid. This is particularly true if the service rendered to the state and to society by the teaching profession is fully weighed and measured.

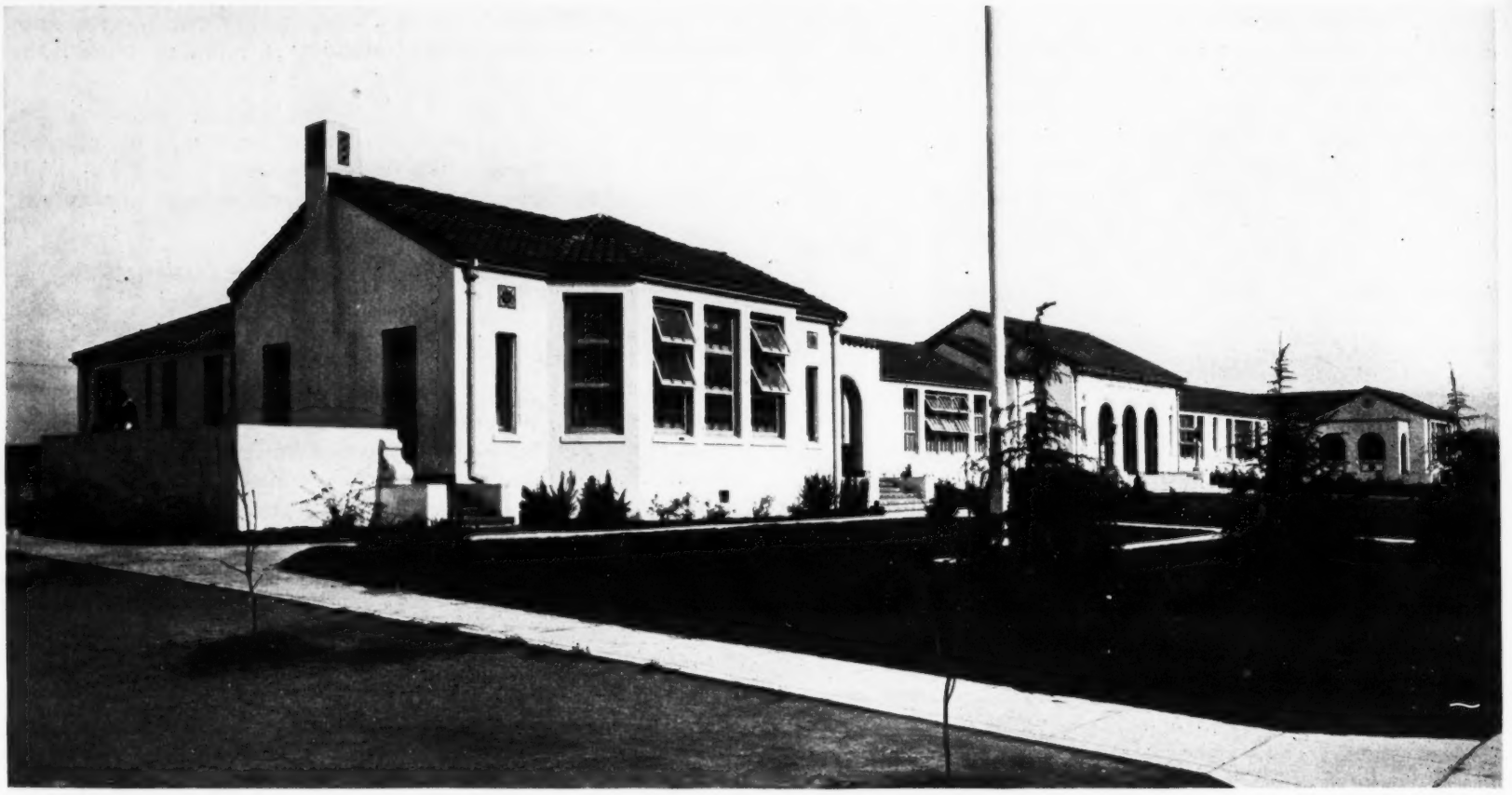
The considerations, however, which enter at this point are of a serious nature. The budgetmaking body is confronted with a condition and not a theory. The problem is reduced to one of dollars and cents in which the finer qualities involved must be ignored. The school administrator may recognize the indispensable service rendered by the teacher, and the value of that service to the economic and civil life of the nation, but the tax ability of the community must finally determine the budget problem as a whole.

In any school budget the salary item is the largest. The temptation is that, if cutting must be done, such cutting begin here. Where the salary item is spared, the pruning knife is likely to enter the building and maintenance and operating costs and the general supply and equipment lists. But, a discriminating judgment must weigh the relative importance of this or that item in the budget.

On the assumption that the school authorities proceed upon the accepted policy that teachers' salary schedules must not be cut, it follows that, in many instances, such a policy would not and could not be carried out. The viewpoint of the individual school administrator may differ. He may approach the salary schedule from the earnings achieved in other fields of activity. He may believe that the pleadings of the taxpayer are justified. He may even adhere to the supply-and-demand rule in fixing compensation. But in either event those who believe in upholding the higher salary schedule must submit to the inevitable law which says that you cannot expend the dollar which you do not possess.

In many communities the salary lists remain intact. No reductions have been made and none are in contemplation. In many sections of the country, including some of the larger centers of population, decisive reductions have been made. The reductions and nonreductions have made for an inequality in the salary schedules as a whole. These inequalities will unquestionably be leveled in the future.

The adjustments in the school-finance situation are practically completed. When further reductions in property valuations are experienced further adjustments may become necessary.



MINTIE WHITE PRIMARY SCHOOL, WATSONVILLE, CALIFORNIA
Wm. H. Weeks, Architect, San Francisco, California.

ONE-STORY BUILDING FOR PRIMARY SCHOOL

The White Primary School at Watsonville, Calif.

The Mintie White Primary School Building at Watsonville, Calif.. has been planned to serve a school consisting of a kindergarten and six elementary grades. It occupies a site 116 by 271 ft., with the principal frontage along the long axis and facing west.

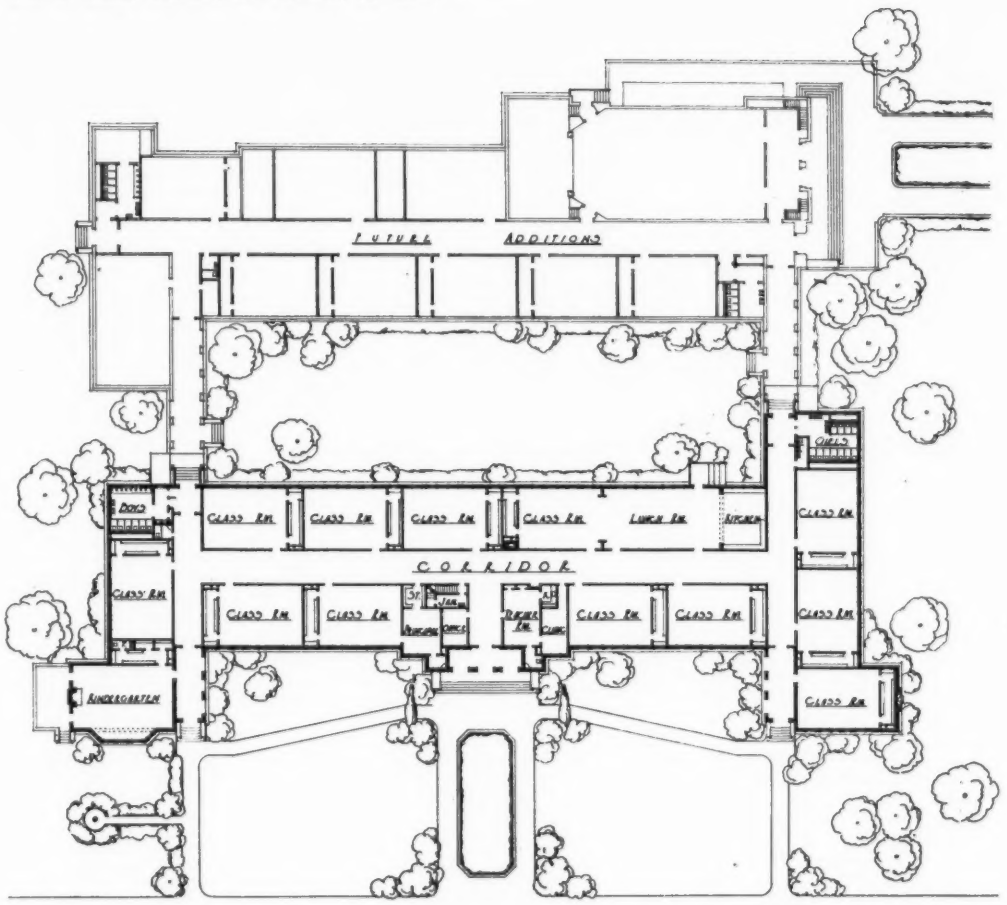
The building is without basement, except for a small area occupied by the heating apparatus. There are twelve standard classrooms and a kindergarten, a lunchroom, toilet rooms for boys and girls, an office for the principal, a teachers' room with kitchenette, and a medical inspection clinic. The lunchroom which measures 22 by 43 ft., is used also for double class groups, etc.

When the district which the building serves is fully built up, six additional classrooms will be constructed. An auditorium-gymnasium, a domestic-science suite, and a manual-training shop will be included in the completed building.

The building is designed in the Spanish Colonial style, with reinforced concrete walls and floors. The exterior trim is of cement plaster and decorative tile. The corridors have linoleum floors, texture plastered walls and ceilings, and meritas wainscot. The classrooms have plastered walls and ceilings. slate blackboards, hardwood finish floors, and meritas wainscot. The toilet rooms have cement plastered walls and cement floors.

The building is heated with a low-pressure direct steam system and is equipped with automatic thermostatic control. The electrical equipment includes lighting in all the rooms and electric signal gongs and fire alarm.

The building which was planned and erected under the supervision of Mr. William H. Weeks, of San Francisco, California, cost a total of $88,188.50.



MINTIE WHITE PRIMARY SCHOOL, WATSONVILLE, CALIFORNIA
Wm. H. Weeks, Architect, San Francisco, California.

THREE MISSOURI CITIES PASS BOND ISSUES FOR SCHOOL BUILDINGS

Maplewood, University City, and Normandy, Missouri, all suburban cities of St. Louis, have passed bond issues during the latter half of 1932, taking advantage of low building prices.

The Maplewood board of education and Supt. G. E. Dille led the group on June 7, with more than a two-thirds' majority vote on $152,000. This amount is being spent for a second unit addition to the high school, an elementary-school addition, and a new colored school. The bond issue will be taken care of with no additional tax increase.

On October 7, the board and Supt. Charles Banks, of University City, carried a bond issue of $225,000, without an additional tax increase. The funds for the new bond issue will be used to erect and equip an elementary school and to add a gymnasium-auditorium to the Hawthorne School.

On November 22, the board of education and Supt. F. B. Miller of Normandy, carried a bond issue of $225,000 for a third unit of the high-school group. This issue carried with it a small tax increase.

Mr. William B. Ittner, St. Louis, acted as architect for all the new suburban city schools.

PUBLIC SCHOOLS MAY BE USED WHEN ADMISSION FEE IS CHARGED

Schools may be used for recreational activities by students and faculty in the production of plays, contests, athletic games, and musical programs, even though they may be in competition with other purveyors of entertainment in the school district. This decision was recently rendered by the Supreme Court of Utah in reversing a ruling of the District Court which restrained public schools from using school buildings for entertainment where a fee is charged.

The court, in its decision, made its ruling in the case of *George Beard* v. *Board of Education of North Summit School District*, and pointed out that the plaintiff had no constitutional or other legal right to enjoy a monopoly in his line because he had been first in the field. On the charge that "illegal use" had been made of the school property in providing recreational and educational facilities, even though an admission fee is charged, it was pointed out that this is not upheld by the law or by decisions in other states. The laws of the State of Utah distinctly empower school boards to make community centers of their institutions and such schoolhouses may be used free, except in cases where a paid entertainment is given.

A Check List for Senior-High-School Buildings

Thomas J. Higgins, Assistant, Bureau of Building Survey, Chicago, Ill.

The present Check List for Senior High Schools is similar to the Check List for Junior High Schools published in the SCHOOL BOARD JOURNAL for August, 1932. The schedule has been used successfully in Chicago and is a most useful starting point for any careful study of a school building which a superintendent, a principal, or a school board may attempt. The schedule should be used three times: First, when the preliminary studies are being made; second, when the architect has submitted the first drawings; third, when the final working drawings and specifications are about to be accepted.—Editor.

Dimensions of Building .....
Number of Stories .....
Orientation .....
Pupil Capacity .....
Association of Subjects .....

ADMINISTRATIVE SUITE

Location .....
Size .....
Public Space .....
Clerks' Space .....
Principal's Office .....
Asst. Principal's Office .....
Vocational Adviser's Office .....
Conference Room .....
Storeroom .....
Vault .....
Toilet .....
Wardrobe .....
Public Telephone Booths .....
Radio Control .....
Elec. Program Clock .....
Post Office Boxes .....
Key Case .....
Telephone .....

AUDITORIUM

Location .....
Number of Seats .....
Balcony .....
Adaptable to Public use .....
Public Foyer .....
Men's and Women's Toilets .....
Drinking Fountains .....
Motion-Picture Booth .....
Stage .....
Size .....
Footlights .....
Border Lights .....
Proscenium Arch .....
Orchestra Pit .....
Dressing Rooms .....
Scenery Storage .....
Acoustics .....
Broadcasting System .....
Clock .....

GYMNASIUM

Number .....
Location .....
Adaptable to after-school use .....
Adjoining Playground .....
Orientation .....
Size .....
Ceiling Height .....
Bleachers .....
Glass Area .....
Type of Windows .....
Height of Sill above Floor .....
Toilets .....
Drinking Fountains .....
Recessed Ceiling Lights .....
Kind of Floor .....
Kind of Walls .....
Sound-deadening Material in Ceiling
Plug Receptacle for Lantern .....
Radio Outlet .....
Physical Director's Office .....
Telephone .....
Clock .....
Storeroom and Apparatus Room ...
Equipment .....

CORRECTIVE GYM

Location .....
Size .....
Ceiling Height .....
Kind of Walls .....
Mirror .....
Storeroom .....
Telephone .....
Clock .....
Equipment .....

NATATORIUM

Location .....
Orientation .....
Size .....
Ceiling Height .....
Bleachers .....
Glass Area .....
Kind of Glass .....
Type of Windows .....
Height of Sill above Floor .....
Metal Doors and Trim .....
Kind of Floor .....
Kind of Walls .....
Sound-deadening Material in Ceiling
Physical Director's Office .....
Toilets .....
Runway Shower .....
Drinking Fountains .....
Telephone .....
Clock .....
Size of Pool .....
Kind of Material .....
Curb Raised above Floor .....
Diving Board .....
Type .....
Under-water Lighting of Pool .....
Suit Sterilization Room .....
Method of Filteration and Sterilization .....

LOCKER AND SHOWER ROOMS

Location .....
Size — Boys' .....
Girls' .....
Ceiling Height .....
Glass Area .....
Metal Doors and Trim .....
Kind of Floor .....
Kind of Walls .....
Number of Lockers:
Boys' .....Size:.....
Girls' .....Size:.....
Ventilated .....
Benches .....
Showers:
Boys' .....
Number .....
Girls' .....
Number .....
Type .....
Material .....
Dressing Booths for:
Girls .....
Number .....
Drying Rooms .....
Hair-drying Room .....
Drinking Fountains .....
Toilets .....
Team Rooms .....
Girls' Restroom .....
Matron's Room .....
Towel Room .....
Laundry .....
Telephone .....

LUNCHROOM

Location .....
Size .....
Ceiling Height .....
Glass Area .....
Sound-absorbing Material in Ceiling
Kind of Floor .....
Kind of Walls .....
Radio Outlet .....
Clock .....
Number of Tables .....
Number of Seats .....
Kind of Table Tops .....
Number of Serving Counters .....
Length of Serving Counters .....
Dishwashing Room .....
Location .....
Ventilation .....
Manager's Office .....
Telephone .....
Kitchen .....
Size .....
Kind of Floor .....
Kind of Walls .....
Type of Equipment .....

FUEL

Coal .....
Gas .....
Electricity .....
Bakery .....
Type of Ovens .....
Storerooms .....
Helps' Rooms .....
Elevators .....

ENTRANCE FOYER

Size .....
Bulletin Boards .....
Seats .....

CORRIDORS

Width .....
Ceiling Height .....
Fireproof .....
Kind of Floor .....
Kind of Wainscot .....
Recessed Lockers .....
Number of Lockers .....
Size of Lockers .....
Ventilated .....
Recessed Rubbish Receptacle .....
Recessed Drinking Fountain .....
Number .....
Janitor's Closets .....
Clocks .....

STAIRWAYS

Number .....
Location .....
Fireproof .....
Width .....
Height of Riser .....
Width of Tread .....
Type of Tread .....
Handrails .....

TOILET ROOM

Number .....
Location .....
Number of Water Closets — Girls'..
Number of Water Closets — Boys'..
Number of Urinals .....
Number of Lavatories .....
Electric Dryers .....
Kind of Floor .....
Kind of Walls .....

LIBRARY

Location .....
Available for Public use .....
Adjoining Study Rooms .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Unilateral .....
Type of Window .....
Kind of Floor .....
Kind of Walls .....
Sound-deadening Material in Ceiling and Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Transoms over Doors .....
Number of Tables .....
Number of Seats .....
Number of Volumes .....
Kind of Stocks .....
Artificial Lighting .....
Type .....
Charging Desk .....
Book-repair Room .....
Storeroom .....
Telephone .....
Clock .....
Bulletin Board .....
Plug Receptacle for Lantern .....
Radio Outlet .....

CIVICS ROOM

Location .....
Size .....
Kind of Floor .....
Kind of Walls .....
Kitchenette .....
Dean's Office .....
Storeroom .....
Folding Writing Board .....
Plug Receptacle for Lanterns .....
Corkboard .....
Telephone .....
Number of Seats .....
Adjustable .....
Teachers' Cases .....
Recessed .....
Special Cases .....
Recessed .....
Teachers' Wardrobe .....
Recessed .....
Writing Boards .....
Color .....
Material .....
No. of Lineal Feet .....
Corkboard .....
Type of Artificial Lighting .....
.....
Telephone .....
Plug Receptacle for Lantern .....
Radio Outlet .....
Clock .....

TYPEWRITING ROOM

Number .....
Number of Pupils .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Unilateral .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....

Number of Doors to Corridor .....
Recessed in Corridor Walls .....
Size and Type of Glass in Doors
Transoms over Doors .....
Number of Seats .....
Teachers' Cases .....
Special Cases .....
Recessed .....
Filing Cases .....
Recessed .....
Teachers' Wardrobe .....
Recessed .....
Writing Boards .....
Color .....Material .....
Ruled .....
No. of Lineal Feet .....
Sound-absorbing Material in Walls and Ceiling .....
Corkboard .....
Type of Artificial Lighting .....
Telephone .....
Plug Receptacle for Lantern .....
Plug Receptacle for Dictaphone ....
Radio Outlet .....
Clock .....

CLASSROOMS

Number .....
Number of Pupils .....
North Light .....
East Light .....
South Light .....
West Light .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Unilateral .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Size and Type of Glass in Doors
Transoms over Doors .....
Number of Seats .....
Adjustable .....
Teachers' Cases .....
Recessed .....
Teachers' Wardrobe .....
Recessed .....
Writing Boards .....
Color .....
Material .....
Number of Lineal Feet .....
Corkboard .....
Type of Artificial Lighting .....
Telephone .....
Plug Receptacle for Lanterns .....
Radio Outlet .....
Clock .....

COMMERCIAL ROOMS

Number .....
Number of Pupils .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Unilateral .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Size and Type of Glass in Doors ....
Transoms over Doors .....
School .....
Location .....
Date .....

STUDY ROOMS

Number .....
Location .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Size and Type of Glass in Doors
Transoms over Doors .....
Number of Seats .....
Teachers' Cases .....
Recessed .....
Writing Board .....
Color .....
Material .....
Lineal Feet .....
Corkboard .....
Type of Artificial Lighting .....
Telephone .....
Plug Receptacle for Lantern .....
Radio Outlet .....
Clock .....

COMMERCIAL GEOGRAPHY ROOMS

Number .....
Number of Pupils .....
Location .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Size and Type of Glass in Doors
Transoms over Doors .....
Number of Tables .....
Number of Seats .....
Teachers' Cases .....
Recessed .....
Teachers' Wardrobe .....
Recessed .....
Special Cases .....
Recessed .....
Display Cases .....
Map Cases .....
Demonstration Table .....
Writing Boards .....
Color .....
Material .....
Number of Lineal Feet .....
Corkboard .....
Type of Artificial Lighting .....
Sink .....
Telephone .....
Plug Receptacle for Lantern .....
Radio Outlet .....
Clock .....

BOOKKEEPING ROOMS

Number .....
Number of Pupils .....
Location .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Size and Type of Glass in Doors ...
Transoms over Doors .....
Number of Tables .....
Number of Seats .....
Teachers' Case .....
Recessed .....
Teachers' Wardrobe .....
Recessed .....
Special Cases .....
Recessed .....
Key Cabinet .....
Writing Board .....
Color .....
Material .....
Number of Lineal Feet .....
Corkboard .....
Type of Artificial Lighting .....
Sink .....
Telephone .....
Plug Receptacle for Lantern .....
Radio Outlet .....
Clock .....

CALCULATING ROOMS

Number .....
Number of Pupils .....
Location .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Transoms over Doors .....
Number of Desks .....
Teachers' Case .....
Recessed .....
Teachers' Wardrobe .....
Recessed .....
Key Cabinet .....
Writing Boards .....
Color .....
Material .....
Number of Lineal Feet .....
Corkboard .....
Type of Artificial Lighting .....
Sink .....
Telephone .....
Plug Receptacle for Lantern .....
Radio Outlet .....
Clock .....

COOKING ROOM

Number .....
Number of Pupils .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Size and Type of Glass Door .....
Transoms over Doors .....
Number of Tables .....
Number of Ranges .....
Number of Sinks .....
Teachers' Cases .....
Recessed .....
Special Cases .....
Recessed .....
Teachers' Wardrobe .....
Recessed .....
Refrigerator .....
Electric .....
Lavatory .....
Writing Board .....
Color .....Material .....
Number of Lineal Feet .....
Corkboard .....
Type of Artificial Lighting .....
Telephone .....
Plug Receptacles .....
Radio Outlet .....
Clock .....
Practice Dining Room .....
Demonstration Room .....
Storeroom .....

SEWING ROOM

Number .....
Number of Pupils .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Wall .....
Size and Type of Glass in Doors
Transoms over Doors .....
Number of Tables .....
Number of Sewing Machines .....
Teachers' Cases .....
Recessed .....
Tote Tray Cases .....
Recessed .....
Display Case to Corridor .....
Special Cases .....
Recessed .....
Teachers' Wardrobe .....
Recessed .....
Sinks .....
Cutting Table .....
Model Stand .....
Fitting Booths .....
Ironing Boards .....
Writing Boards .....
Color .....Material .....
Number of Lineal Feet .....
Section of Writing Board to the Floor .....
Corkboard .....
Type of Artificial Lighting .....
Telephone .....
Plug Receptacles .....
Radio Outlet .....
Clock .....

ART ROOMS

Number .....
Number of Pupils .....
Orientation .....
Size .....
Ceiling Height .....
Glass Area .....
Kind of Glass .....
Unilateral .....
Type of Windows .....
Height of Sill above Floor .....
Kind of Floor .....
Kind of Walls .....
Number of Doors to Corridor .....
Recessed in Corridor Walls .....
Size and Type of Glass in Doors....
Transoms over Doors .....
Number of Desks .....
Teachers' Cases .....
Recessed .....
Special Cases .....
Recessed .....
Sink .....
Drawing-board Storage .....
Worktable .....
Model Stands .....
Posing Stands .....
Display Case to Corridor .....
Writing Board .....
Color .....Material .....
Number of Lineal Feet .....
Corkboard .....
Sliding Corkboard Front Wall .....
Type of Artificial Lighting .....
Telephone .....
Plug Receptacle for Lanterns .....
Radio Outlet .....
Clock .....

(Concluded in February)

On December 17, 1903, at Kitty Hawk, N. C., the Wright Brothers, Orville and Wilbur, made their first practical flight. This dramatic achievement was the result of *proper application of knowledge.*

In June, 1930, the Herman Nelson Corporation announced the first practical application of latest ventilating knowledge to the problem of schoolroom ventilation. An achievement of nation-wide importance!

Achievement

the result of PROPER APPLICATION OF KNOWLEDGE

FOR years, scientists have known that it is necessary to introduce outdoor air into the schoolroom *only for the purpose of maintaining correct temperatures.* In 1930 the Herman Nelson Corporation, properly applying this knowledge, perfected the Her-Nel-Co System of Ventilation—the greatest of this company's many achievements in the art of heating and ventilating.

Today, the Her-Nel-Co System is widely recognized as the standard for modern schoolroom ventilating practice—because it *produces the best ventilating results at the least cost.*

You will be interested in the story of this achievement in schoolroom ventilation. Write for the book, "Her-Nel-Co System of Ventilation".

THE HERMAN NELSON CORPORATION, MOLINE, ILLINOIS

HERMAN NELSON

Her-Nel-Co SYSTEM OF VENTILATION

The Herman Nelson Corporation are Originators and Pioneers of Univent Ventilation, the Her-Nel-Co System of Ventilation, the Invisible Radiator, and other heating and ventilating innovations that have received world-wide recognition.

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Boston, Mass.	Rochester, N. Y.	Richmond, Va.	Miami, Fla.	St. Louis, Mo.	Seattle, Wash.	Osaka, Japan
Melrose, Mass.	Philadelphia, Pa.	Roanoke, Va.	Birmingham, Ala.	Des Moines, Ia.	Denver, Colo.	Oslo, Norway
Barrington, R. I.	Allentown, Pa.	Charlotte, N. C.	Indianapolis, Ind.	Minneapolis, Minn.	Phoenix, Ariz.	Buenos Aires, Argentine
New York, N.Y.	Harrisburg, Pa.	Cleveland, Ohio	Evansville, Ind.	Duluth, Minn.	Portland, Ore.	
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New Rochelle, N.Y.	Pittsburgh, Pa.	Memphis, Tenn.	Appleton, Wis.	Dallas, Texas	Calgary, Alberta	Shanghai, China
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Reduce Classroom Failures

and SAVE EDUCATIONAL DOLLARS with Improved Lighting

● "Cut expenses! Save money! Reduce budgets!"—is the cry today.

Possibly it has not occurred to you that when pupils fail to pass in their classes the cost of their education is greatly increased. *Statistics show that annual education costs in public schools range from $45 to $124 per pupil.* Obviously, this cost is doubled when a pupil fails.

Well-lighted classrooms have proved their value in reducing classroom failures.

In a recent study, two student groups, which examinations showed to have practically equal ability, were assigned to separate rooms—one with the inefficient Twilight Zone* lighting prevalent in most classrooms today, the other with adequate, automatically-controlled illumination. Of the group handicapped by inadequate lighting, 38% failed—while only 14% failed in the room with scientifically correct illumination.

A Westinghouse-planned installation of Magnalux luminaires, controlled by light-sensitive relays for automatic lighting during cloudy periods, gives the best possible illumination for eye conservation. Light from Magnalux luminaires is distributed evenly over the ceiling without glaring bright spots or irritating dark spots. The entire ceiling then becomes the source of light, radiating a flood of completely diffused, restful illumination.

Westinghouse Magnalux Luminaires will bring your school out of the Twilight Zone.

HERE'S a quick, simple method of testing your lighting. Open a phone book at random in any classroom. You should be able to read any name, address, and number rapidly and without effort—for the telephone book is scientifically designed for perfect legibility under proper light. If you can't—if you have to squint and draw the book closer to your face—the students are not getting enough light to do their best work.

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**Twilight Zone—the deceptive half-light between obvious darkness and scientifically correct illumination.*

THE STATUS OF HIGH SCHOOLS IN UNITED STATES

More than one fourth of all the 23,390 public high schools in America are located in five states, covering Texas, Ohio, Pennsylvania, Missouri, and Illinois, according to a recent report issued by the U. S. Office of Education. Texas high schools reported a total of 1,400; Ohio, 1,322; Pennsylvania, 1,185; Missouri, 1,063; and Illinois, 1,065. Fourteen other states reported from 500 to 1,000 public high schools.

The largest high school in the United States is the DeWitt Clinton High School for boys in New York City, which has an enrollment of 10,059 students. The New Utrecht and the James Madison High Schools, in Brooklyn, New York, are next largest, with enrollments of 9,944 and 8,711.

The total enrollment in all types of public high schools is 5,465,932, and the school enrollment of children 15 to 18 years of age is approximately 50 per cent of the total number of children of that age recorded by the 1930 census. Two thirds of this group go to regular high schools, while the other third attend reorganized high schools. More than 71,000 students attend high schools offering abbreviated courses, making it necessary to attend other schools to get additional work for graduation.

The public high schools graduated 591,719 young men and women during the year 1929–30. Forty-six per cent of the graduates of city high schools were boys, and 43.5 per cent from the rural schools were boys. Nearly one half of the graduates continued their education after leaving the high school.

The report indicates that the percentage of boys attending college has decreased, while that of girls has increased during the period from 1921 to 1929.

SCHOOL BUDGETS IN LARGE CITIES SUFFER FIVE PER CENT CUT

School budgets in cities of more than 100,000 population have been reduced over 5.3 per cent for the current school year, according to a report of the United States Office of Education, published in the *United States Daily* for December 14. The expenditures were cut over 37 per cent for capital outlay and nearly 5 per cent for salaries.

The total current expenditure reductions have varied from 1.5 per cent in the North Atlantic states, to 20.5 per cent in the South Central group. The reduction in salary budgets, excluding New England, reached 14.62 per cent.

Enrollment, it was shown, went up 1.39 per cent. This means an increase of 240 pupils in a typical city of 100,000 enrolling 17,500 pupils.

Teaching staff went down 2.13 per cent, with a reduction of 11 teachers for a typical city.

Teachers' salaries went down 4.96 per cent. Although the average reduction appeared to be only 4.96 per cent, it was in fact much greater. New York, where the salary schedules were unchanged, was included in the figure, but Chicago was not included. In New York, the teachers gave more than $2,000,000 for relief, while Chicago teachers were paid in warrants which were discontinued. If the salary budget were near $1,050,000, the 4.96 per cent reduction in the salary budget would suffer a reduction of about $52,500.

The assessed value of property yielding school funds went down 7.5 per cent. This would automatically reduce the income available for schools in a typical 100,000 city with an assessed valuation of $150,000,000 by more than $146,000, even if the tax rate were kept at $13 a thousand.

Current expenses went down 5.32 per cent, as compared with a teacher budget slash of 4.96 per cent. The reduction for a typical city of 100,000 population with a budget of $1,500,000 would be $79,800.

Capital outlay went down 37.98 per cent.

State aid went up 2.13 per cent. This occurred in the eastern and western states, but not in the central states.

In the matter of school curtailments, it was shown that nearly two thirds of 478 cities, 10,000 to 100,000 in population, had reported some activities curtailed, or wiped out. A few schools, on the contrary, had actually increased their services.

School Law

School Lands and Funds

An act providing for the distribution of the equalization fund to local school boards applying was held unconstitutional as violating the provision for pro rata distribution of the school fund among the counties (Ky. constitution §§ 183, 184, 186, 188; acts of 1930, c. 36, §§ 4, 5, 8; Ky. statutes, §§ 4364, 4399a-8, 4434a-14a).—*Talbott* v. *Kentucky State Board of Education*, 52 Southwestern reporter (2d) 727, 244 Ky. 286.

The state board was held vested with authority to make contracts for paying bonds belonging to the permanent school fund before their maturity.—*State* v. *Hatcher*, 52 Southwestern reporter (2d) 794, Tex. Civ. App.

The state treasurer could not accept payment on unmatured bonds belonging to the permanent school fund, except under conditions imposed by the state board of education.—*State* v. *Hatcher*, 52 Southwestern reporter (2d) 794, Tex. Civ. App.

Orders of the state superintendent of public instruction and state board of education in proceedings for wrongfully discharging the plaintiff as superintendent of public schools were final, and could not be attacked by a school district which was party to the proceedings.—*Borger Independent School Dist.* v. *Dickson*, 52 Southwestern reporter (2d) 505, Tex. Civ. App.

School-District Government

The school board is an entity deriving its powers solely from the legislature and is bound by legislative enactments prescribing its duties (Smith-Hurd revised statutes of 1931, c. 122, §§ 155, 157a).—*People* v. *Board of Education of City of Chicago*, 182 Northeastern reporter 455, 349 Ill. 390.

The school trustees who misappropriated school funds out of which the superintendent's claim was to be paid were held personally liable.—*Borger Independent School Dist.* v. *Dickson*, 52 Southwestern reporter (2d) 505, Tex. Civ. App.

School-District Property

That architects in contract for furnishing plans for school building agreed to employ designated engineers was held not to affect the contract's validity (Minn. statutes of 1927, §§ 2846, 2847).—*Krohnberg* v. *Pass*, 244 Northwestern reporter 329, Minn.

That a school district, contracting with architects, paid them for services on a prior contract for a building which was never constructed, did not invalidate the present contract.—*Krohnberg* v. *Pass*, 244 Northwestern reporter 329, Minn.

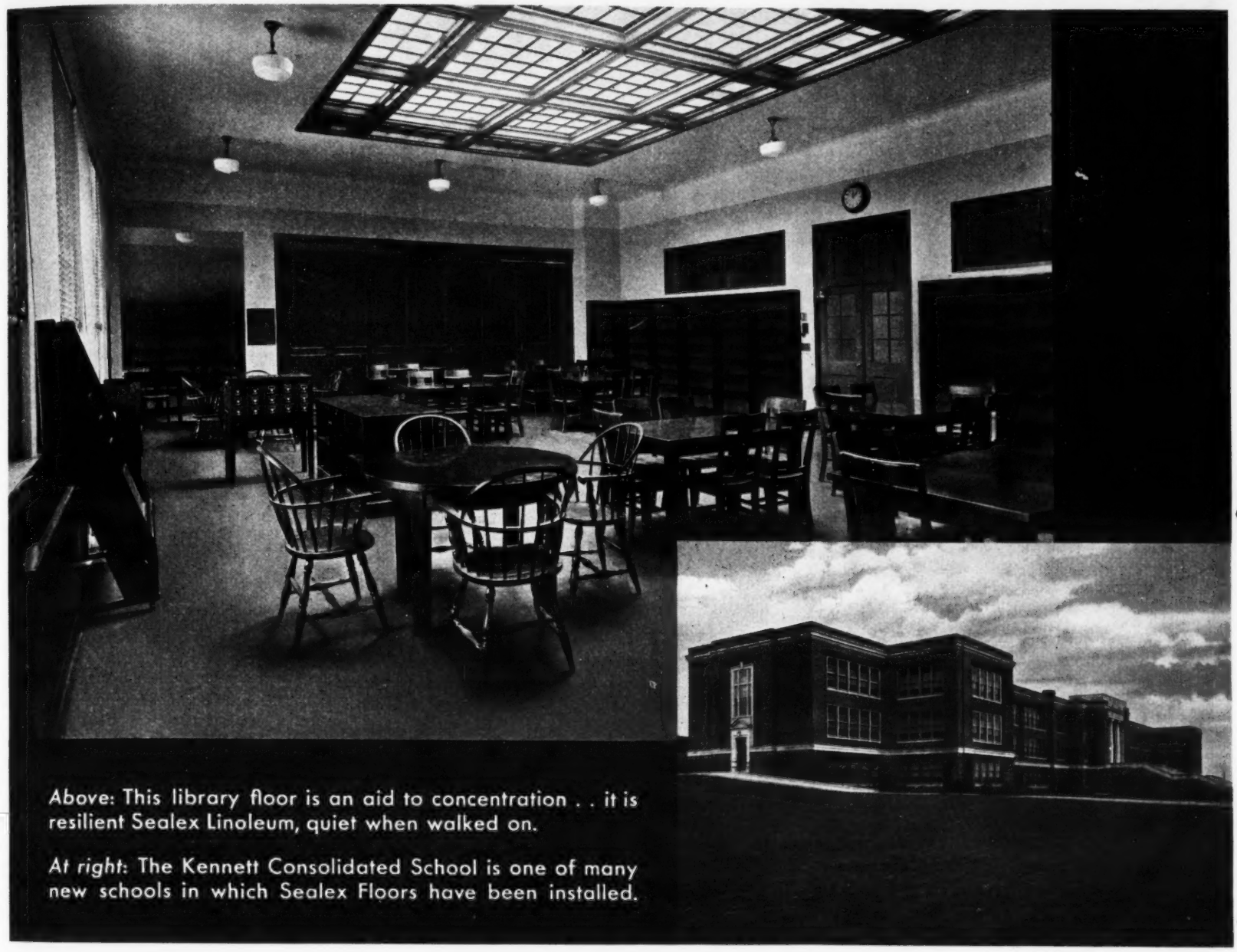
Statutes requiring competitive bidding for school contracts were held inapplicable to a contract for architects' services (Minn. statutes of 1927, §§ 2846, 2847).—*Krohnberg* v. *Pass*, 244 Northwestern reporter 329, Minn.

The superintendent of construction, required to see that plans were carried out and proper material furnished for a school building, was held not within the statutes requiring competitive bidding (Minn. statutes of 1927, §§ 2846, 2847).—*Krohnberg* v. *Pass*, 244 Northwestern reporter 329, Minn.

A city school board's acceptance of an insolvent building contractor's assignments of moneys due him amounted to the creation and recognition of assignee's liens thereon (N. Y. lien law, § 5, as amended by the laws of 1929, c. 515, § 2).—*Vanderlip* v. *Walker*, 259 N. Y. S. 289, 144 Miscellaneous 629, N. Y. Sup.

Assignments of moneys due a school-building contractor, to subcontractors and materialmen for work and material furnished was held valid (N. Y. lien law,

(Concluded on Page 56)



Above: This library floor is an aid to concentration . . it is resilient Sealex Linoleum, quiet when walked on.

At right: The Kennett Consolidated School is one of many new schools in which Sealex Floors have been installed.

One of America's largest consolidated schools . . . . . chooses Sealex

The Kennett Consolidated School, Kennett Square, Pa., has been called "a monument to practical philanthropy." The generosity of a public spirited citizen made possible one of the finest and best-equipped schools of its type in the United States.

The heavy corridor traffic in this wide spreading building travels on Sealex Linoleum Floors —the finest resilient floors ever developed for heavy duty. In hundreds of schools. Sealex Floors have proved their ability to give long service under the most difficult conditions.

Longevity is only one among many Sealex advantages. These floors are resilient. They muffle the noise of footsteps. They make the day's work easier for teachers who are on their feet most of the day.

These floors are healthful. There are no unsightly, dirt-collecting cracks—no troublesome splinters. Sealex Floors are spot-proof, stain-proof, easy to clean.

These floors are economical. Recent reductions bring the prices down to the lowest levels in many years.

Sealex materials, when installed by authorized contractors of Bonded Floors, are backed by Guaranty Bonds. Our School Floors Department will gladly supply further information.

CONGOLEUM-NAIRN INC., KEARNY, N. J.

SEALEX
LINOLEUM FLOORS

Hard on Shoes..Hard on *Floors*

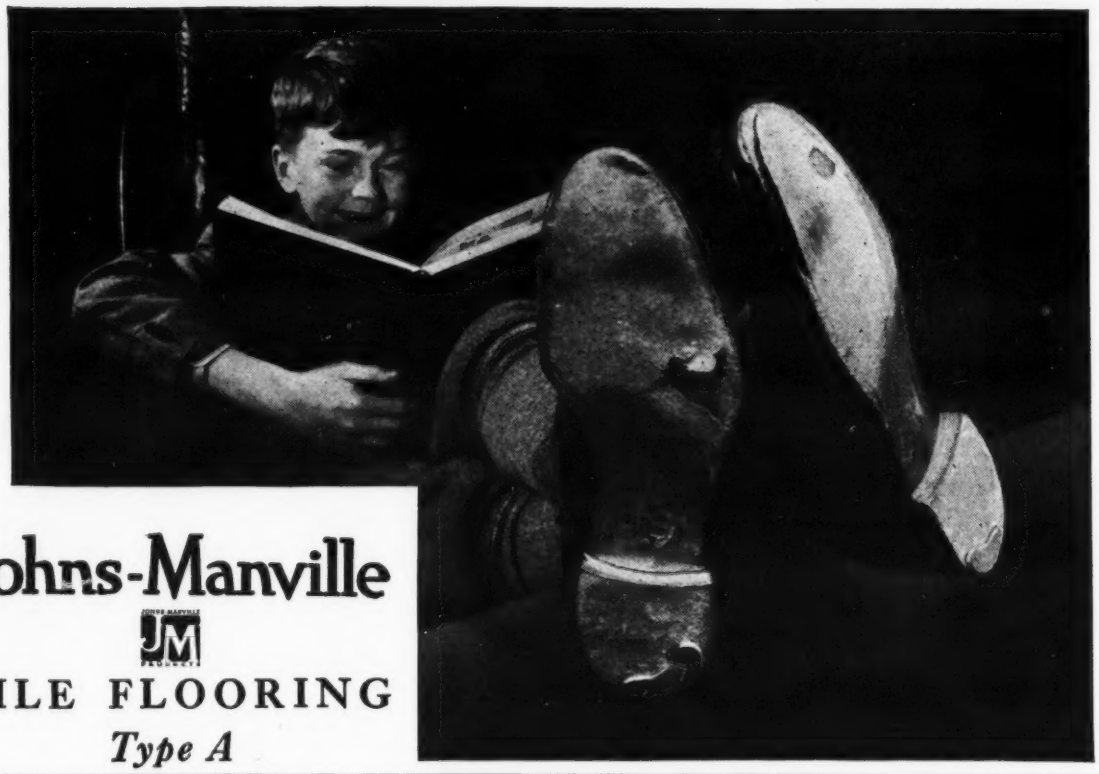
YOU'D almost say he took a mischievous delight in wearing out his shoes — in providing teachers and school boards with flooring problems to worry over. Yet he really never gives these matters a thought. He's just an active, growing boy with restless feet and an abundance of energy.

And Johns-Manville has solved one of the problems he presents. They've provided a flooring for schools that he, and the millions like him, won't wear out even with years of use.

J-M Tile Flooring *thrives* under school traffic. It has a high resistance to abrasion. The constant buffing of footsteps over its surface serves only to bring out its luster.

Nor does this long-lived flooring require more than a minimum of care. An ordinary brush or broom — an occasional wash-down with soap and water — is all that's necessary to keep it clean and attractive. Inks won't stain it . . . neither will ordinary acids.

This floor is comfortable . . . quiet . . . and safe for hurrying feet.



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Type A

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The rich colors in which this flooring is available will add warmth and cheer to the appearance of your school buildings. 12 solid colors and 8 mottled colors are offered, in tiles from 3 in. to 12 in. square, to combine with any decorative scheme.

In two thicknesses, 1/8 in. and 3/16 in., the cost of J-M Tile Flooring is comparable with linoleum of the same thickness.

Because all good flooring needs skillful laying, Johns-Manville has appointed Authorized Flooring Contractors in over 300 cities to serve you.

Send for the booklet, "Underfoot Overhead," giving full details. Address Johns-Manville, 292 Madison Avenue, New York City.

(Concluded from Page 54)

§ 25, subd. 1, as amended by the laws of 1930, c. 859, § 15). — *Vanderwalker* v. *Walker,* 259 N. Y. S. 289, 144 Miscellaneous reporter 629, N. Y. S.

Subcontractors and materialmen, to whom a school-building contractor assigned moneys due him, not for money advanced, but for the payment of past indebtedness for work and material furnished, was held not entitled to priority of payment over other lienors (N. Y. lien law, § 25, subds. 1, 4, 6, as amended by the N. Y. laws of 1930, c. 859, § 15). — *Vanderwalker* v. *Walker,* 259 N. Y. S. 289, 144 Miscellaneous reporter 629, N. Y. S.

A construction superintendent, whom a school building contractor agreed to pay a weekly bonus, in addition to an hourly wage, was held entitled to preference over other creditors in payment of a bonus (N. Y. lien law, § 13). — *Vanderwalker* v. *Walker,* 259 N. Y. S. 289, 144 Miscellaneous reporter 629, N. Y. S.

A "school district," being an instrumentality of the state, is not liable for the acts of omission of its officers, in the absence of a statute. — *School Dist. No. 28* v. *Denver Pressed Brick Co.,* 14 Pacific reporter (2d) 487, Colo.

The failure of a school district to perform the details of statutory duty merely constitutes a tort for which the school district is not liable. — *School Dist. No. 28* v. *Denver Pressed Brick Co.,* 14 Pacific reporter (2d) 487, Colo.

The failure of a materialman to see that the contractor filed a statutory bond with the school board was held to constitute a negligence, precluding recovery from a school district (C.L. 9514; laws of 1923, pp. 480, 481, § 2, and § 3, as amended by the laws of 1929, p. 525). — *School Dist. No. 28* v. *Denver Pressed Brick Co.,* 14 Pacific reporter (2d) 487, Colo.

School-District Taxation

Part of an act delegating to high-school district clerk's power to determine the value of high-school property as a basis for a tuition tax on property outside such districts, without notice to the taxpayers, or opportunity for a hearing, was held unconstitutional. — *Weinacht* v. *Bower,* 14 Pacific reporter (2d) 622, Oreg.

Since an act, requiring high-school district clerks to report interest on value of high-school property to the county superintendents, specifies no rate of interest, the law implies the legal rate (Oreg. code of 1930, § 35-4102). — *Weinacht* v. *Bower,* 14 Pacific reporter (2d) 622, Oreg.

Teachers

A teacher employed for the school year 1930–31, and who received no notice of dismissal prior to June 10, 1931, was held employed for the following school year, notwithstanding the fact that prior to June 10, another teacher ostensibly had been employed (Calif. school code, §§ 5.401, 5.680, 5.681). — *Thibaut* v. *Key,* 14 Pacific reporter (2d) 138, Calif. App.

A probationary school teacher refusing to accept a contract for the following school year, and not applying for reinstatement, until two months after school opened, had no claim as to future tenure (Calif. school code, §§ 5.401, 5.402, 5.640). — *Snider* v. *Severance,* 14 Pacific reporter (2d), 328, Calif. App.

That a copy of a resolution of the board of education, declaring a high-school teacher's position vacant was mailed without registration June 8 and received by her June 15, was held ineffective discharge, and the teacher was automatically reëlected for the ensuing year (Calif. school code, §§ 5.401, 5.681, 5.682). — *Reed* v. *Board of Education of Monterey Union High School Dist.,* 14 Pacific reporter (2d) 330, Calif. App.

School Finance and Taxation

♦ New York, N. Y. Economies adopted by the board of education in its 1933 school budget were severely criticized as an abandonment of sound educational policies by the Public Education Association in a current issue of its official organ, "The Public and the Schools." The Association pointed out that the services which had been developed to meet definite needs have been eliminated or badly crippled. All plans for improving service, for expansion, for increasing facilities, for developing new techniques to care for old problems, are also in danger of being eliminated.

The retention of the recently appointed executive manager, at a salary of $7,000, was deplored in the face of other economies. It was suggested that the board should abolish this position as evidence of its good faith in spending such moneys as have been placed at its disposal solely and entirely for the best interests of the children.

♦ Detroit, Mich. Members of the board of education have begun a study of the financial requirements of the schools for the school year 1933–34. The tentative budget figures presented by Supt. Frank Cody and Asst. Supt. John E. Thomas, call for a net tax budget of $14,127,581 next year. Included in the budget are increases over the estimated expenditures for the current year totaling $3,120,000. These represent the amount required to return the school system to normalcy. If they are approved, the school year will be lengthened from nine to ten months, and the proposed retrenchments as emergency measures will be discontinued.

The largest item in the increase, $2,314,000, represented the saving to the board this year as a result of closing the schools a month earlier than usual next spring. Of this total, $2,004,000 represented the cost in personal service and $310,000 the operating cost for one month.

The total maintenance budget figure is $22,585,421, as against total estimated expenditures of $19,464,941 this year. The capital costs budget of $90,000 was put at $105,000 in the new budget.

♦ Chicago, Ill. A total levy of $80,590,180 for the six school-tax levies of 1933 has been proposed to the board of education by Howard P. Savage, business manager of the board. These levies are the amount of taxes which the school board is expected to assess and the total is $24,605,736 in excess of the levy allocated to the school board recently by the citizens' committee on public expenditures, which had proposed keeping the levies of all county taxing bodies under $200,000,000. Mr. Savage, the business manager, pointed out that the budget figure is $28,010,121 below the tentative estimate set for the 1932 appropriation. Among the amounts allotted for tentative school appropriations are the following: $58,232,500 for the educational fund; $11,384,489 for the building fund; $7,984,444 for bonds and interest.

♦ Chicago, Ill. The board of education has asked the city council for permission to issue $3,970,000 in tax warrants for the payment of bond principal and interest charges. In previous years, bond charges were met with cash from other funds which are now depleted. It is expected that the school warrants and city warrants will be purchased by Chicago and New York banks to avoid defaulting on $22,000,000 in bond charges falling due in January.

♦ Fort Worth, Texas. The school board anticipates a need for retrenchment through a shortened school year and additional salary cuts next year, in order to meet a shortage of funds due to lowered tax receipts. The board members have expressed concern over the possibility of the courts applying the new homestead tax-exemption amendment, which was voted in the recent general election, to cities, counties, and school

(Concluded on Page 59)

23 YEARS

OF DEPENDABLE SERVICE

THE *OLD* WALNUT HILLS HIGH SCHOOL, CINCINNATI, OHIO - - - BUILT IN 1908

rendered by POWERS TEMPERATURE CONTROL in this school was one of the reasons why POWERS REGULATION was selected for the *New* WALNUT HILLS HIGH SCHOOL, CINCINNATI. . . .

Architects:
Garber & Woodward

Consulting Engineer:
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The John J. Vogelpohl Co.

After 23 years of dependable regulation in the old Walnut Hills High School, the Powers System of Temperature Control is still giving excellent service and will continue to do so for many more years.

Because of this and many similar records of long life and dependable service, Powers Control is being installed in the new school shown above, which is one of the largest in the State of Ohio.

While the first cost of Powers Control is often higher; it costs much less in the end, because:—

1. It often gives 15 to 20 years of Accurate and Dependable control without repairs of any kind.

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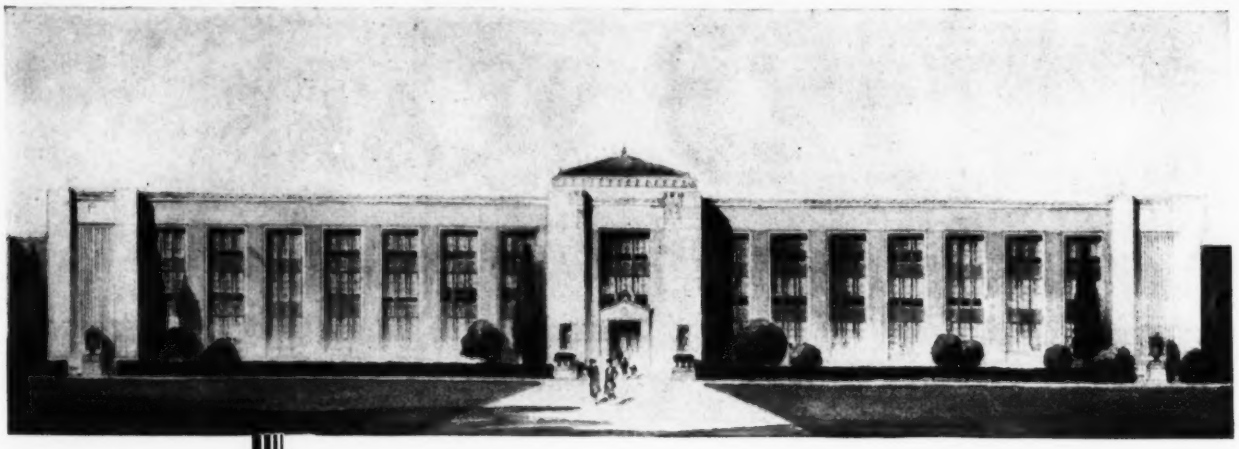

EFFICIENT ECONOMY

These are the days of economy in the school system. Reduced revenues and curtailed budgets suggest economy and the cutting of corners. With the tremendous expansion of the American public school system there has come the problem of a tremendous operating expense out of line with the reduced revenues.

But there is wise economy and unwise economy. There is the political makeshift and the possible failure of service by the lowering of standards. After a century and a half, our educators have set a standard, and unwise economies will mean the ruin of years of labor by one stroke of the pen.

Efficient economy is not impossible or impracticable. It requires courage and a knowledge of the fact. We stand for efficient economy both in execution and the demand for a result. When the school group has adjusted its thinking to this standard, the turning point in the depression has been reached.

The school trade has attempted to sell on the basis of "efficient economy". The child and its progress as a citizen have come first. The economic value of the product and its price have been secondary.

In these days of readjustment, we urge that "price" as the important factor be weighed in the scale of pupil service and the standing of your school in the community. There is a difference between economy and parsimony. Efficient economy suggests you maintain your standard on the basis of a new economy and a new efficiency.

The "regular" school trade will assist in accomplishing this result. The salesman who fails to grasp the significance of the times will eliminate himself quite promptly. Efficient economy is a minimum standard for 1933, and if carried forward consistently will mean a new day in our schools.

Frank Bruce
Publisher

It takes more than good teaching to make a good school

IT may seem a far cry from the floor material that is used in a school, to the success of that school . . . a far cry from floor resiliency to the failure of a pupil. Yet there is such a direct relation that school boards and executives who are awake to the progress of school methods will not ignore it.

Years ago any floor that was fairly durable would do. Hard, harsh floors that echoed every heel click were to be found in practically every schoolroom. The stimulating effects of color were entirely overlooked. The connection between pupils' health and floor cracks that harbored germ-carrying dirt was not even considered.

But today, in truly *modern* schools, instead of the old-time splintery floor there is an apparently one-piece expanse of smooth, gleaming linoleum or a carefully designed area of cork tile, rubber tile, or Linotile.

Lower Costs—Higher Efficiency

Costs of cleaning and maintenance are lower. Rooms are quieter. Teachers and pupils are not fatigued by noise. In fact, an entire class marching through a corridor can hardly be heard.

It is fortunate, indeed, that such floors can be installed in existing buildings. An Armstrong Floor can be laid quickly over the old boards. But whether you consider this step or not, send for free booklets on Armstrong's Floors and Armstrong's Acoustical Products, too. Mail the coupon today.

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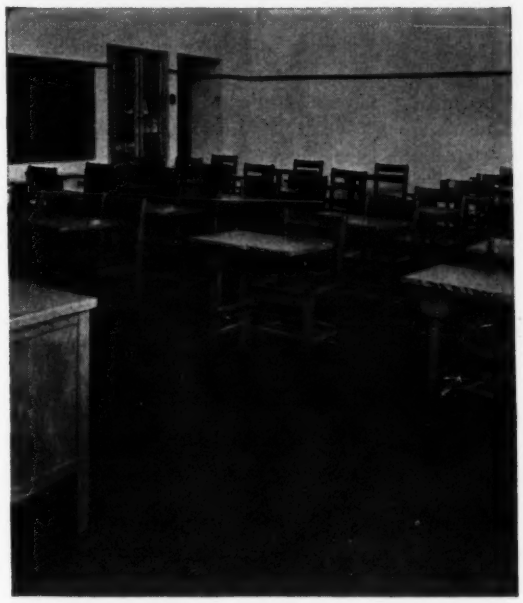

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(Concluded from Page 56)

districts. If the law were applied to Fort Worth, it would mean a loss of $540,000 in school funds.

♦ Salem, Mass. The school board anticipates strong opposition to any retrenchment in the school program. The local teachers' association has sent a communication, asking that it be given a hearing before any changes are made in the salary schedules or school activities.

♦ Mrs. Inez Johnson Lewis, State Superintendent of Public Instruction of Colorado, has urged a careful budgeting of school expenses during the next year, in order to reduce the cost of education. In announcing her plans for the next two years, Mrs. Lewis declared her office will do everything possible to aid in preparing the budgets of the small school districts and in reducing the burden of taxes. Mrs. Lewis pointed out that the rural school particularly must meet the demands of the times without any curtailment in the scope of its efficiency.

♦ Dr. Paul R. Mort, of Columbia University, who recently completed a survey of Ohio school finances, has urged that the state pay more of the cost of operating the public schools and that it adopt a personal earned income tax, a retail or wholesale sales tax, a selective sales tax on tobacco or amusements, or a combination of these to raise the necessary money for the operation of the state's schools.

In a report to the Ohio Survey Commission, Dr. Mort suggested that the state assume more responsibility for the schools and in doing so relieve local property of some of the school-tax burden it has borne.

Dr. Mort declared that most states have a broader tax basis for their schools than has Ohio, where local property tax bears 96 per cent, and the state 4 per cent, of the cost of the schools, and that their schools have not suffered as much during the depression as have the Ohio schools.

In Ohio, he said, lowered real-estate values, reduced personal-property tax returns, and mounting tax delinquencies, have resulted in many schools cutting their terms to as low as seven months and reducing the salaries of teachers from 20 to 40 per cent.

♦ Houston, Texas. The school board recently discussed plans for using the surplus in delinquent taxes for placing the public schools on a cash basis. Mr. H. L. Mills, business manager of the board, estimated that approximately $2,000,000 would be needed to place the schools on a cash basis. He pointed out that the fund reserve in delinquent taxes may be built up to $1,625,000 by the end of the year. In the normal course of events, it was pointed out, the delinquent taxes clear themselves within seven years.

♦ Shelton, Conn. The school board has adopted a revised budget of $150,585, which is $15,135 less than the estimated budget of last year. The new budget calls for a cut of $2,000 in the teachers' salary item, and a cut of one half in the insurance item. The largest item in the budget is $93,800 for teachers' salaries.

♦ Evanston, Ill. The property owners' division of the local real-estate board has started a suit against the Evanston Township High School Board because of its action in reducing its 1931 tax levy by only $106,-020. The division had contended that the levy should be reduced by at least $400,000. The high-school officials, on their part, have claimed that they reduced the 1931 levy to the greatest extent possible. The division made the claim that the taxpayers would be required to pay for supplementary financing twice by reason of the board's refusal to further reduce its levy.

♦ A state-wide movement has been begun in the State of Washington to obtain financial support for education at the next legislative session. Recommendations of the legislative committee of the Washington Education Association included not only the development of new sources of revenue to offset the loss to education through the passage of the 40-mill limit initiative, but the continued support of a movement to equalize the tax burdens of education.

♦ Chattanooga, Tenn. Teachers and cafeterias will bear the larger part of the drastic economy measures to be adopted for the school system. The proposed suspension of manual-training teachers will be followed by releases in other departments, according to Commissioner H. D. Huffaker. The action was taken as a means of absorbing the $31,000 reduction in the school budget for the next year.

♦ Cleveland Heights, Ohio. For the school year 1933, the board of education has adopted a budget of $1,971,988. This does not include the tax on intangibles from which approximately $150,000 will be received by the schools, making the total budget slightly in excess of the amount approved last year. The board also voted to reduce the tax levy by $144,-000 for the next year.

♦ Appleton, Wis. Adamant in its attitude that a cut in the 1933 school-tax levy would seriously cripple the efficiency of the schools, the school board recently flatly refused to assume the responsibility for a cut in teachers' salaries. The action was taken at a conference of school-board members and the city council. At this meeting the council had insisted that the school board reduce its operating costs in line with other city departments.

♦ Racine, Wis. The school board has announced a reduction in the general school budget of $42,910 for the school year 1933. The action represents a 30-per-cent reduction in school expenditures and is exclusive of any cuts which may be made in salaries. The reduction will be accomplished by substantial cuts in salaries and in all items of school supplies and materials.

SCHOOL PROPERTY

The total value of all school property in the United States in 1930 amounted to $9,302,078,-000. The total endowments of all educational institutions from public elementary schools to private and public universities, etc., was $1,914,656,000. The total value of educational holdings was $11,216,704,000 or approximately 7.2 per cent of the assessed valuation of all property in the United States in 1928 subject to taxes.

SCHOOL FINANCES IN THE CITY OF BESSEMER, ALABAMA

School finances in Bessemer, Ala., have been kept on an even keel, according to reports prepared for the board of education by public accountants and presented in the annual report of Supt. J. E. Bryan.

At the close of the school year 1930–31, the board of education frankly faced the assurance of reduced revenues for 1931–32 and prepared a budget calling for $185,089. In view of a possible failure of revenues, plans were made to reduce all possible expense during the year by a program of vigorous economy, which included a reduction in the salaries of school employees and reduced purchasing in every department. The expenses were reduced to $169,169, or $7,474 below the original budget.

The members of the board have accepted the financial responsibility and have sought the coöperation of the teachers and other employees of the system in its efforts to give the children an efficient education, while keeping the school system in a condition of financial solvency. With this end in view, an expense budget of $148,348 has been adopted for the year 1933–34, which shows a still further reduction in every department.

THREE "MODERN" SCHOOL BUILDINGS—AN APPRAISAL

(Continued from Page 44)

tion and supervision. It sounds presumptuous to infer that we may well consider the possibilities of revising our present practices — probably to their own basic improvement — to conform more to a decentralized type of control. It is not even remotely suggested that the educational program should be made to follow building design — quite the contrary — but in this instance the thought seems to have some pertinence. To be specific, the administrative suite is located in the west wing of the school, approximately fifteen classroom units distant from the most remote part of the school. When compared with traditional schools of two or three story heights this distance is not excessive. The plan assumes a complete unit without any apparent means of adding classrooms or other services without materially destroying existing elements. The segmental classrooms, each a unit with its own terrace, have provisions for toilets and wardrobes adjoining the corridor on the inner side. If convenience is the only criterion, the easily supervised adjacent toilet and wardrobe are ideal; if we consider the educative values, the issue is not so clear. The combined gymnasium and auditorium is a compromise of doubtful value. As an economy measure this practice has some justification, as an educational facility its contributions are not so certain. In attempting to serve two unrelated needs, it falls short of satisfying either. The progressive school of today makes constant use of its gymnasium in the physical-education program: its auditorium is the scene of educational activity throughout the day. Where mild weather conditions prevail throughout the school year any extensive provisions for indoor sports or physical activities can scarcely be justified.

The corridor, which consists of two semicircles, on the inner periphery of the classrooms, provides insulation against disturbing playground noises. The architect, however, defeats, in part, this objective by locating a running track on the corridor roof. The sun-bath balcony in connection with the gymnasium, protected by quartz-glass walls to permit penetration of ultra-violet rays is a provision that has not as yet been demonstrated as feasible, or even desirable in sunny latitudes. Manufacturing processes have not yet perfected a quartz glass that will not solarize within a comparatively short time. Admitting that satisfactory glass could be had, proper utilization of this area is limited largely to periods of sunshine when it may be more desirable from both the economic and hygienic viewpoints to get direct exposure from the sun. Exit facilities from the stage portion of the auditorium would not meet safety requirements as established by standardizing agencies. The rather restricted playground area within the oval leads to the inference that more spacious outer areas, not indicated in the plan, are to be provided for major sports. In this case, direct means of egress should be provided from the locker rooms to the out of doors.

It is contemplated that all the structural parts of this school are to be shop fabricated and assembled on the site. This will produce an inflexible standardization which will deny that delightful and frequently necessary variation which has characterized much of modern school architecture.

Lest the criticisms herein seem to overshadow the achievements of the architect, let it be said that the plan has much virtue. Careful analysis of its numerous unique features will reveal possibilities of adaptation to the traditional school plant. Noteworthy are the various elements which break down the customary barriers between the classroom and nature's outdoor laboratory.

The Hessian Hills School

Certain factors, conditioned by costs, the nature of the educational program, and policies of administration and supervision, do not apply with equal degrees of pertinence to the construction of public and private schools. This is well illustrated by the relatively small classrooms in the Hessian Hills School, designed to accommodate fifteen children each. Our criticism here must be tempered by the fact that economic resources of private initiative permits the reduced ratio of pupils to teacher. Whether or not the increased cost is commensurate with the educational product must be determined by those who finance the school. In the case of the public school the tendency is toward larger and ever larger classes. Experimental evidence has never been conclusive as to the optimum size of the class, and the economic emergency is now forcing upon the country a nation-wide experiment, which, if even moderately successful, will establish new standards for class size that will persist after the emergency has ceased. The implications for present and future school-building projects are significant. Assume that larger classes were irrefutably demonstrated to produce as efficiently as classes enrolling fewer pupils. No school, private, special, public, or parochial, could escape the demand for adjustment on the new basis. This adjustment will impose new demands for building flexibility. Permanent divisions between classrooms, consisting of coatrooms, plumbing fixtures, ordinary partitions, and widened piers in exterior walls, are all structural features which tend to freeze our schools into rigid forms which can be altered only at prohibitive costs. The alcoves in classrooms intended for group conferences are innovations which may prove themselves well worth the additional expense. Differentiation of rooms as to size and equipment for varied activities may find reasonable justification in the private school. In the public elementary school the tendency is toward limited laboratory facilities in all classrooms, with little differentiation between rooms. The simple expedient of increasing glass area to insure more light complicates rather than solves the problem of natural lighting. Shades will be drawn or pupils will be shifted away from the areas of intense light near the windows. Objectionable and injurious shadows and glares are multiplied. Rather complete laboratories for food preparation are included in the plan, but lunchroom facilities are lacking.

The writer notes with approval the central provisions for garment storage. The close supervision occasioned by classroom wardrobes may be depriving the elementary school of large opportunities in developing in its pupils a sense of personal responsibility for property. Terraces immediately accessible to each classroom, the open fields and the inviting woods near by are exceedingly desirable educational influences. In harmony with recent trends both in this country and abroad, the architects, in coöperation with the director and the faculty of the Hessian Hills School, have achieved a building design which appreciates the oft-neglected opportunities afforded by outdoor work. Regardless of the merits or shortcomings of the various details of the plan, the designers have courageously used the opportunity to express their convictions. "Modern education cannot therefore be satisfactorily fitted into the usual type of school architecture. Its material requirements are different and its spirit far from the traditional. The old-type school with its withdrawal from the world of reality could function in the monastic type of architecture so popular with universities. The rudimentary school, interested only in the three R's, got on very nicely in the "little red schoolhouse." But a modern school needs to be housed in a building which not only meets its very exigent physical requirements, but which is direct, sincere, and in harmony with its purpose."[4] Their composition is more than a structure planned to serve the particular needs of this school: it partakes of the nature of an experiment. The proved merits of the plan as well as its demonstrated deficiencies and failures will accrue to the benefit of all school-building construction.

MR. H. E. HENDRIX
State Superintendent of Public Instruction,
Phoenix, Arizona

Mr. Hendrix, who assumed the position of State Superintendent of Public Instruction on January 1, was formerly city superintendent of schools at Mesa. He succeeds C. O. Case.

Mr. Hendrix is a graduate of North Central College, Naperville, Ill., and has had considerable experience as a school administrator holding the superintendency in a number of cities. He was given the master's degree by Stanford University, and the Ph.D. degree by New York University.

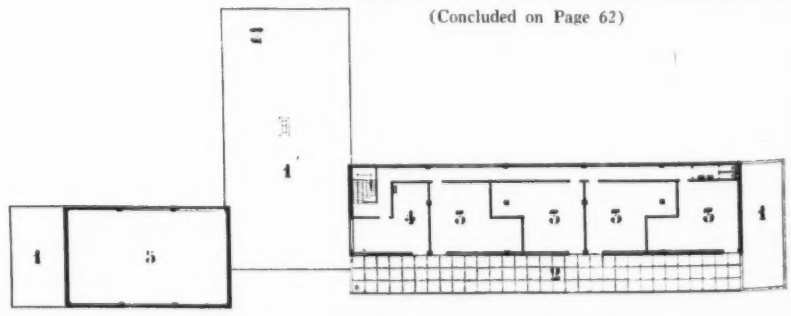
The Bauhaus School

Whenever the school architect has been led to attempt a harmonious adjustment between his de-

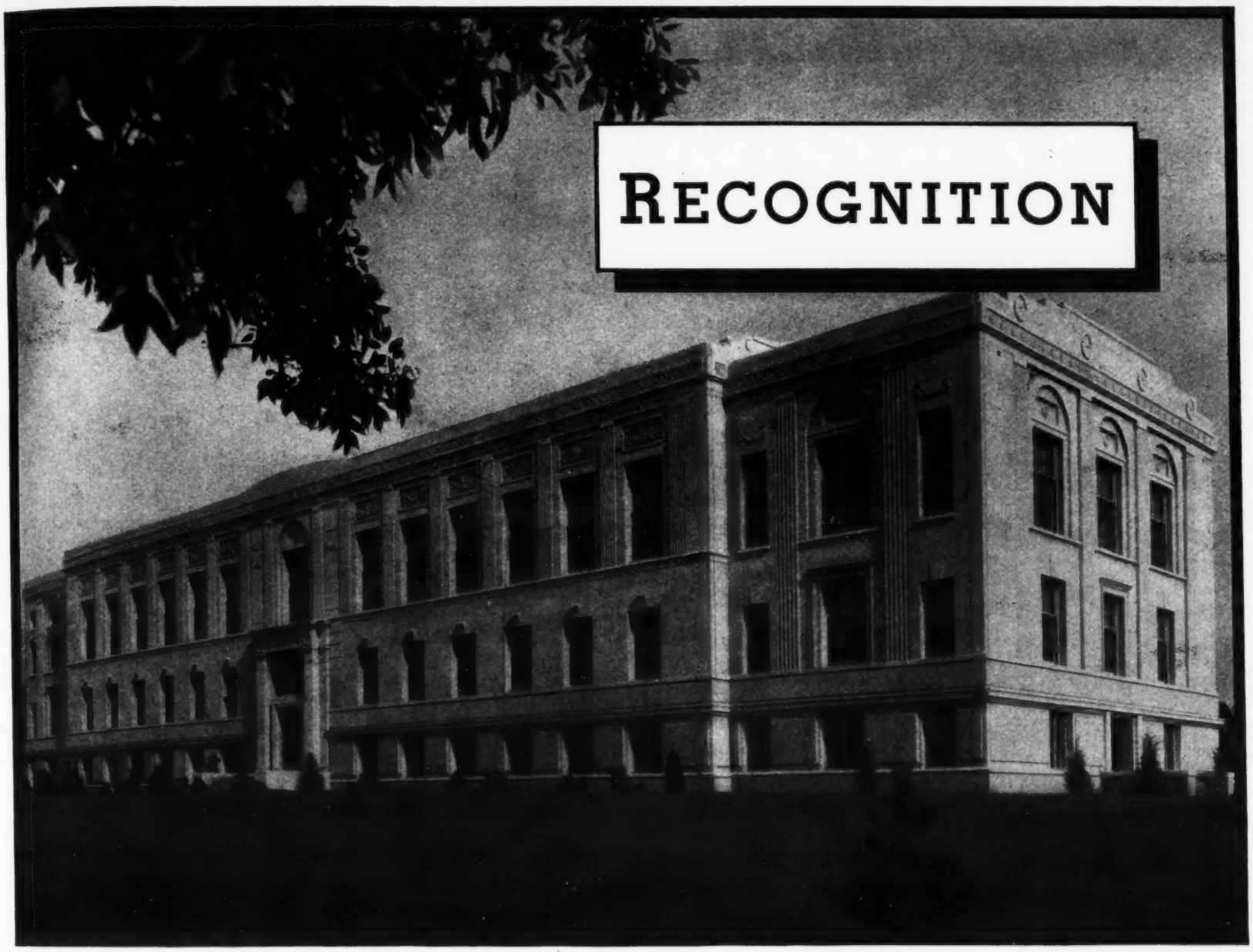
[4]Moos, Elizabeth, "A School that Breaks with Tradition," *American School and University*, Fifth Annual Yearbook, 1932.

(Concluded on Page 62)

A CLASSROOM IN THE HESSIAN HILLS SCHOOL, CROTON-ON-HUDSON, NEW YORK
Howe and Lescaze, Architects.



SECOND FLOOR PLAN, HESSIAN HILLS SCHOOL, CROTON-ON-HUDSON, NEW YORK
Howe and Lescaze, Architects.
SYMBOLS: 1. Roof; 2. Terrace; 3. Classrooms; 4. Studio; 5. Upper Part of Auditorium.



Givens Hall, School of Architecture, Washington University, St. Louis, Mo.

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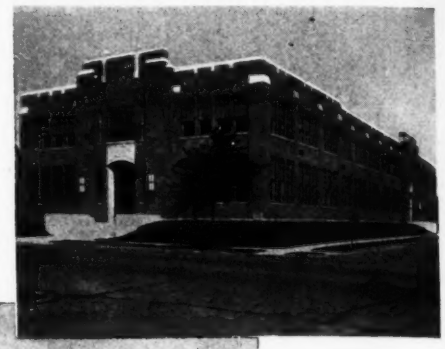
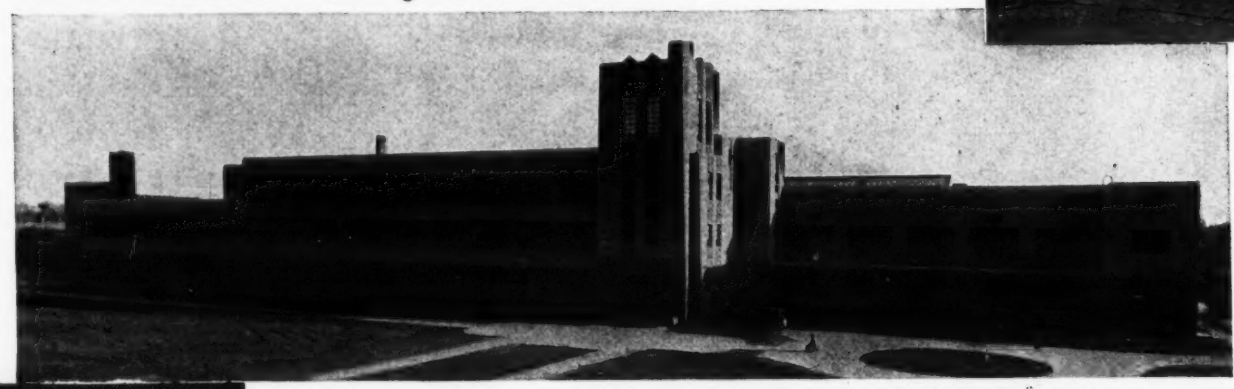
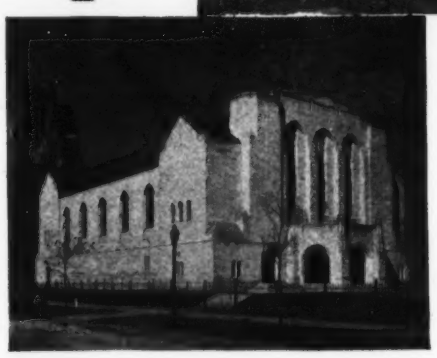
MANITOWOC VOCATIONAL SCHOOL
Manitowoc, Wisc.

Architect
William J. Raeuber
Manitowoc, Wisc.







GEO. R. THORNE MEMORIAL HALL
McKinlock Campus
Northwestern Univ.
Chicago

Architects
James Gamble Rogers
New York
Childs and Smith
Chicago

THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, Peoria, Ill.
Architects: Hewitt, Emerson and Gregg, Peoria, Ill.

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(Concluded from Page 60)

sign or plan and the changing concepts of the method and content of education, it has been necessary for the public to make a corresponding adjustment in its appreciation of his achievement. The public in general is skeptical of the new and strange. Nevertheless, the process of proving many things and holding fast that which is good must go on. In a preceding paragraph some critical comments were made on the gross structure and external appearance of the Bauhaus School. These observations, however, must be qualified by an understanding of the technical and utilitarian factors which occasioned the introduction of unusual elevations. The quotation below indicates an architectural trend which merits serious consideration.

"First of all, the modern architect working in the new style conceives of his building not as a structure of brick or masonry with thick columns and supporting walls resting heavily upon the earth but rather as a skeleton enclosed by a thin light shell. He thinks in terms of *volume* — of space enclosed by planes or surfaces — as opposed to *mass* and solidity. This principle of volume leads him to make his walls seem thin flat surfaces by eliminating moldings and by making his windows and doors flush with the surface."[5]

The Bauhaus School is a technical or semitechnical residential school with provisions on the premises for student and faculty quarters. Without an intimate acquaintance with the administrative organization and educational program any criticism offered on the building must be accepted with qualifications.

The character of the work to be done in the shops and laboratories justifies in large measure the generous provision of natural light. The centrally located and easily accessible auditorium and dining hall are well conceived, except that additional exit facilities are needed in the auditorium and stage. A more desirable orientation of the structure would have complied with the well-established standard of southeast or east instead of northern exposure for the classrooms. The removal of completed projects, and the delivery of instructional material and machinery through the doors in the carpenter shop can be effected only with difficulty. The isolated ground-floor location of this shop provides an excellent opportunity for a separate delivery and service exit. The sports field gives evidence of an athletic program, but the plans fail to show the essential locker and bathing facilities. The ordinary needs of the administrative function seldom demand the amount of floor area alloted to this suite. The location of this service is a little inconvenient. American practice commonly locates administrative offices on the ground floor reasonably close to the main entrance. Features of critical importance in American schools, such as general locker and storage service, have been omitted or are not indicated in the plans. Although the skeleton construction which eliminates bearing walls seems to produce flexibility, yet additions to the building could only be made at the sacrifice of values inherent in the existing structure. The location of the shops and studios in separate wings at maximum isolation from the classroom sections gives evidence of the sound planning used in the articulation of all services.

It has been with a measure of indulgence that the writer attempted to evaluate these new-type buildings. There is so much of good in them, and they express so definitely attempts to improve design and arrangement, that any criticism, except that which is positively constructive, must be futile.

[5]Barr, Alfred H., Comments in *Modern Architecture* (New York: Museum of Modern Art, 1932), p. 14.

THE CHERRY HILLS SCHOOL, DENVER, COLORADO

(Concluded from Page 29)

classrooms and all of the other rooms have sand-finished plastered walls. The ceilings throughout are the exposed concrete of the roof slab, and it is planned later to cover them with an acoustical material.

The building has four entrances and an emergency exit from each classroom. The classroom exits are intended for use in case of fire or panic, and enable each class to pass out to the playground for physical exercises without disturbing any other class.

The exterior of the building resembles in character some of the modern schools of the Netherlacking in effect and interest. The walls are of stiff-mud hard-burned brick, with a split brick every fifth course. Gutters are eliminated, and the roof is of composition over concrete. The maintenance of the exterior has been furthered by eliminating wood so far as possible, and by using permanent materials for all exposed metal work.

Throughout the building, door casings are entirely omitted and ¾-in. round metal bead are used to protect corners. A small base molding 3 in. high makes up the balance of the trim. The coatrooms are provided with a low shelf for rubbers and overshoes, hooks for each pupil, and a shelf for lunch-boxes.

The building is heated by means of low-pressure steam.

The building was planned by Messrs. W. E. and A. A. Fisher, architects, of Denver, Colo. Dr. O. S. Wood, professor of education at the University of Denver, acted as consultant.

STATE SCHOOL-BUILDING SERVICE IN MISSOURI

(Concluded from Page 28)

each child a sanitary and safe building in which he may attend school. Provisions recently made by the state legislature give some financial assistance to the districts in providing these buildings. Service rendered by the state department should assist the local district through information on school-building construction, operation, and maintenance. It

(Continued on Page 64)

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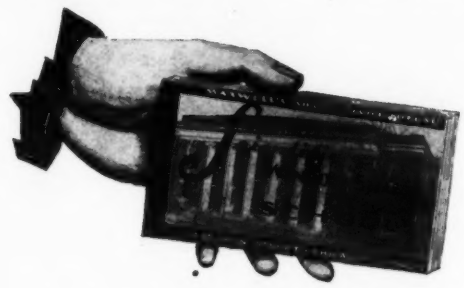

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(Concluded from Page 62)

should assist local districts in determining whether they should build and what should be erected to house the children of their respective districts. It should assist local districts in making alterations in existing buildings to make them more serviceable. It should assist the local districts in new construction by setting up definite requirements, by advice in making contracts, and by inspection of plans before the building is constructed. It should assist local districts in securing the greatest possible service from buildings now in use through proper operation and maintenance.

ACHIEVING A PRACTICAL IDEAL IN RURAL SCHOOLS

(Concluded from Page 24)

for boys and girls, toilets for boys and girls, and a small teachers' room.

The school may be converted into a two-room building as is indicated in the floor plan. The enlargement has been carefully arranged for. When the change is made, cloakroom No. 2 becomes a toilet room for boys with an increased number of fixtures. Cloakroom No. 1 from which the present girls' toilets are removed will be transformed into a boys' cloakroom. The future addition will provide for a girls' cloakroom and toilet rooms. The change has been carefully taken into account in that the plumbing has been arranged with proper slip joints, additional drains, etc.

The building is equipped with electric light, furnished from the feed line on the highway. A good quality of slate blackboard has been used, tack boards have been provided, the furniture is of the movable adjustable type. The equipment includes a piano, tables and chairs for the kindergartners and primary children, a sand table, a library table and chairs, etc.

The building was erected in the winter of 1931–32, at a cost of less than $8,000 complete.

STANDARDS FOR JUNIOR-HIGH-SCHOOL BUILDINGS

(Concluded from Page 22)

desirable but are not recommended except in very large schools or in schools where unusual conditions make them advisable.

Clothing Laboratory. While sewing may be the major activity in the clothing laboratory, it should be kept in mind in planning this unit, that the work should include simple designing, problems of purchasing, study of textiles and related studies.

The physical features of the dressmaking laboratory should be similar to those of the academic classroom except that the room should be larger. The window area should be not less than 25 per cent of the floor area. Northern exposure is usually preferred.

Equipment. 1. Sewing tables, approximately 30 by 60 inches, of sturdy construction but light enough to be easily moved. Hardwood or linoleum tops.

2. Comfortable, light, wooden chairs or stools, stained to match the tables.

3. Cabinets of various kinds are probably more necessary in this room than in any other. There should be individual drawers approximately 26 by 20 by 6 inches; lockers for dresses and coats approximately 24 inches deep and 64 inches high, with a single rod running down the center 2 inches from the top upon which dress hangers are hooked. Locker doors may be of either wood or glass with master-keyed locks. Storage cabinets with spaces arranged in various sizes to hold equipment and supplies. One or more glass cabinets for display purposes.

4. Sewing machines of both electric and pedal models should be supplied. Electric wall plugs should be convenient to all machines. One machine for every four to six students should be provided.

5. Built-in ironing boards, electric irons with six-foot cord suspended on adjustable arm. Wall electric outlet equipped with red light as current indicator. Fireproof container for storage of iron.

6. Lavatory or sink with hot and cold water.

7. Other equipment may include filing cases for patterns, drawing and samples, drawing and painting materials, dress forms, blackboards, bulletin boards, book and magazine cases.

A fitting room should adjoin the sewing room. This room may be small but must be well lighted and equipped with one or more fitting pedestals, screens, triple, adjustable mirrors 4 to 5 feet in length, flat wall mirror, hanging rack and one or two chairs. In small schools, if a separate fitting room cannot be provided, provision should be made to screen off a corner of the sewing room for this purpose.

In large schools it is often necessary to have a separate storeroom adjoining the laboratory. This room should be equipped with cupboards, cases and inclosed adjustable shelving.

Other laboratories, as homecraft and millinery, may be desired in some junior high schools, although they are not usually necessary except in trade schools or very large schools. Rooms and equipment should be designed for the particular purposes for which they are used.

(To be continued)

THE DEPARTMENT OF SUPERINTENDENCE MEETING AT MINNEAPOLIS

President Milton C. Potter has announced the completion of the tentative program for the meeting of the Department of Superintendence, to be held February 24 to March 2, at Minneapolis, Minn. The meetings will be held in the beautiful new convention hall located in the downtown section. This building offers every modern convenience for the comfort of visitors. The exhibits, which are an important feature of the convention, will be housed in the auditorium.

The subject for discussion at the meeting will be "Education for a Changing World." Among the important speakers who will appear on the program are Prof. Charles H. Judd, Prof. George D. Strayer, William S. Bogan, Paul Stetson, E. C. Hartwell, Ellwood P. Cubberley.

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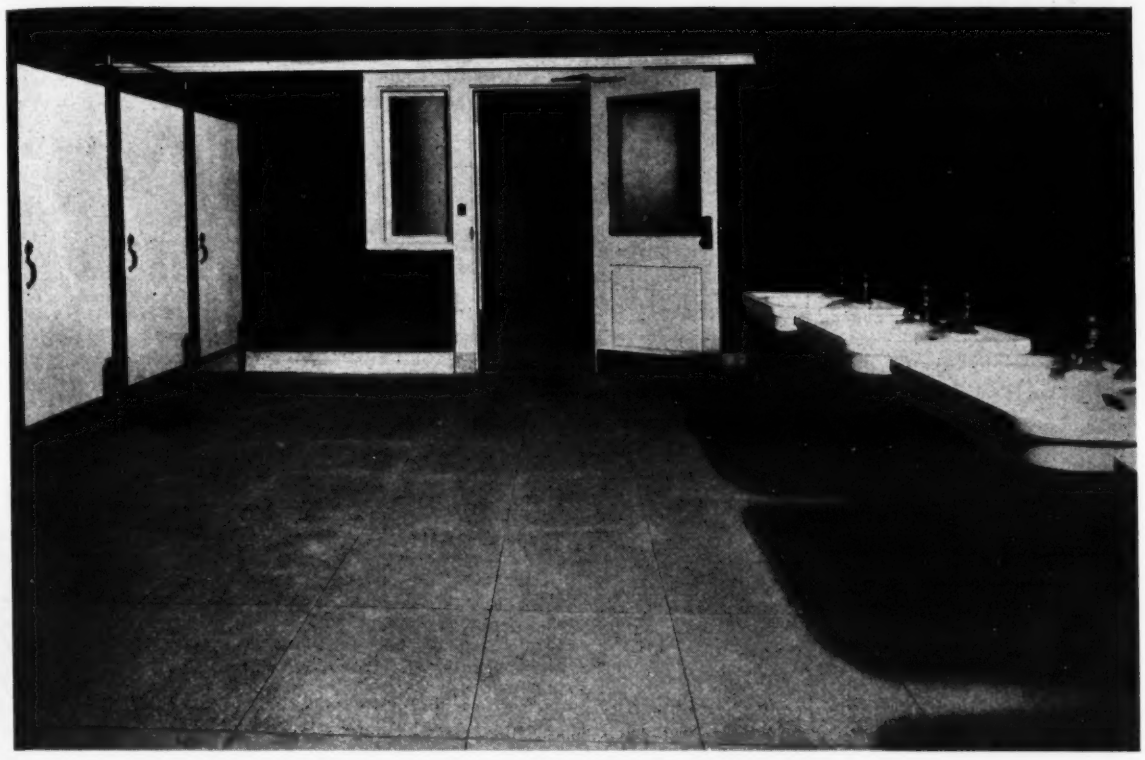

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Book News

Planning School Buildings

By John J. Donovan. Cloth, 7¾ by 11 in. 355 pages. Price, $6.50. The Bruce Publishing Company, Milwaukee.

Mr. Donovan has added another work of real merit to his already many large contributions in the field of school architecture. Macmillan & Company have published his elaborate work entitled, *School Architecture* some ten years ago.

This new presentation has great practical value. It is intended for architects concerned with the construction of school buildings, building committees of boards of education, school officials, such as superintendents, business managers, principals, and heads of technical departments, state departments of education seeking to standardize construction in the field of their authority, and all who are interested in the development of a fine type of school-building construction.

Mr. Donovan has been instrumental in the establishment of a complete set of standards for all classes of school buildings, including elementary schools, junior high schools, and senior high schools. The standards are in minute detail for not only classrooms of every possible kind, but also for departments requiring the most technical provisions. In all of these instances, he has provided a working basis for all officials concerned and a checking schedule to enable officials to keep down costs and to review thoroughly the work of construction while in progress.

While complete enough to satisfy the highest ideals of construction, his plan of standardization yet holds in mind the necessity of great economy, especially in view of recent economic trends. In addition, Mr. Donovan has not forgotten that elements of beauty can be most influential in education. His conceptions of building construction emphasize completeness, economy, and beauty. In all, Mr. Donovan has made a distinct contribution through this new work. — *Frederick M. Hunter.*

My Addition Drill Book
My Subtraction Drill Book

By Guy M. Wilson. Paper, 56 and 48 pp. Each 32 cents. The Macmillan Company, New York City.

The author assures teachers that with the use of these drill books, 100-per-cent results are possible for 95 per cent of pupils. In a word to the pupil in the addition book, he says that: (1) All the facts are given. (2) There is a complete plan. (3) The work is given step by step, and every step is an easy one. (4) Every child can win.

These books provide an easy method of teaching and learning all the facts and processes of addition and subtraction in a gradual and systematic arrangement. Clear directions are given to the pupil at each step and one or more examples are worked out to show the process. The pupil can check his own work with the table of answers at the end of each book.

The Laws of Healthy Living

By C. E. A. Winslow and Mary L. Hahn. Cloth, 249 pp., illustrated. 64 cents. Charles E. Merrill Company, New York City.

The third book of the "New Healthy Living" series makes a definite but not a detailed study of the structure and functions of the component parts of the body. Only enough of these background facts are presented as are necessary for an understanding of the laws of health. Pupil activities at the end of the chapters are called "things to do and think about."

The Secretary's Book

Prepared by Thomas K. Brown and edited by W. D. Lewis and E. A. Singer. Cloth, 940 pages. Published by John C. Winston Company, Chicago, and Philadelphia.

The "Secretary's Manual" has been compiled in response to a demand for a book which will help the individual to say what he wants to say and say it well. While it was not the author's purpose to discuss the more tangible aspects of a secretary's job, the material is of such a character that it gives valuable information on matters which come up constantly in the performance of the secretary's duties.

The book is a guide or handy manual for correct English, and includes approved forms for business, official, and social correspondence. The section on writing contains chapters on the more important types of business writing, with briefs, minutes, and telegraph forms discussed and illustrated. Letter writing is also taken up wth various forms of address and styles of composition considered.

The section on useful information gives rules for filing and instructions in preparing manuscripts. A third section deals with the mechanics of good writing, including chapters on grammar, punctuation, spelling, and other subjects.

The fourth section is a complete dictionary: the Winston simplified dictionary, containing definitions of some thirty thousand words.

The last part of the book is an appendix of useful information, containing a list of foreign words, names of persons and places, a list of business terms, word formations, abbreviations used in writing and printing, signs and symbols, and weights and measures.

Wonders of the Plant World

By William Atherton Du Puy. Illustrated by Ethel G. Blossom and Helen Babbitt. Cloth, 196 pages. Price, 88 cents. Published by D. C. Heath and Company, Boston.

This book is the latest addition to the series of Heath supplementary readers. The author brings to the fore in popular language the many interesting things about plant life. He tells the story of the potato, watermelons, and gourds, how the Indians gave us rubber, the origin of the seedless orange, the earth's biggest fruit, etc.

In fact, the book covers a wide range of subjects coming under the heading of fruits, vegetables, grains, shrubs, trees, and grasses, bringing out in a most attractive way the peculiarities of each item.

The Dixon Class Card

By John Dixon. Price, 40 cents. Published by The Bruce Publishing Company, Milwaukee, Wis.

This is a complete, modern class-record form, designed to meet the demands of teachers in both elementary and secondary schools. The form is sufficiently flexible for use with letter grades or per-cent markings, and will serve equally well for various periods of time, ranging from six weeks, or nine weeks, to a semester.

The card has space for a complete class roll and is so sectioned and indexed that any name can be easily and quickly located. The use of modern testing materials is carefully provided for. The most important feature, however, is the plan for reducing the time of averaging class tests and recitations to a minimum.

Household Physics

By Walter G. Whitman. Cloth, 510 pages. Price, $2.75. Published by John Wiley & Sons, New York, N. Y.

This is a revised edition of a work first issued in 1924. It has been brought up-to-date by the addition of the newest findings in the field of theoretical physics, and by the explanation of the newest devices which embody physics — television, radio, oil heaters, etc. The book is thoroughly scientific in its point of view, and is a fine example of thorough motivation of the study of science principles.

Wisconsin Lore for Boys and Girls

By Susan Burdick Davis. Cloth, 283 pages. Published by E. M. Hale and Company, Milwaukee, Wisconsin.

(Concluded on Page 67)

Above: *Installation of Berloy Recessed Steel Lockers at Marquette University, Milwaukee, Wisconsin*

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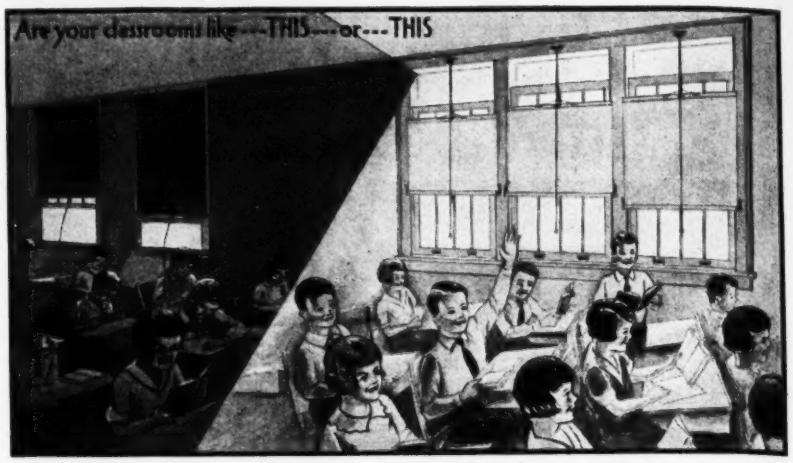

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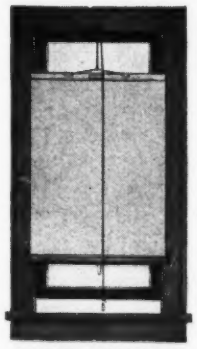

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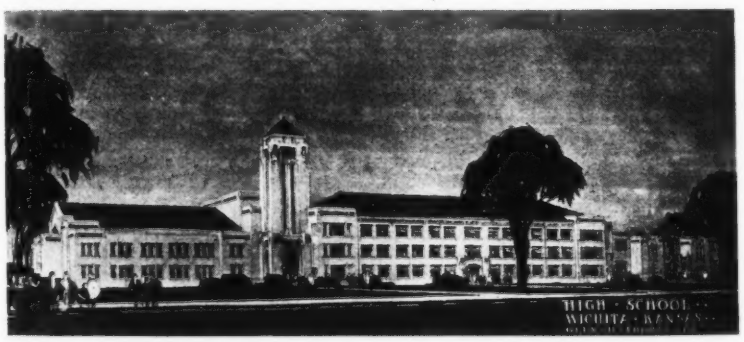

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(Concluded from Page 65)

Here are a series of true stories, delightfully told and appropriately illustrated, which concern themselves with persons and events that attend the making of a great state. Those teaching the history of the midwest states may turn this book to good use in the way of a supplementary reader. The author has lifted out of the voluminous histories and records of Wisconsin a group of interesting incidents relating to the exploration period, to pioneer life, and to early settlement struggles. There was the coming of the Yankee trader, the Cornish miner, the English, German, Irish, and Scandinavian farmer, and the city builder. There is a most interesting chapter on the oldest lead-mining town in southwestern Wisconsin, Mineral Point, which was settled by the Cornish, Welsh, and English. They brought with them old-world notions, customs, and habits of life. The advent of the Germans, too, is interestingly told. The coming of the sturdy Scandinavian is not overlooked.

The book closes with five good stories dealing with pioneer life.

Educational Handwriting Drills and Projects

By John O. Peterson. New Plainer Penmanship Series, first to sixth years. Published by John O. Peterson, at Tacoma, Wash.

This series contains fundamental drills of specific application and projects of wide appeal. The material has been thoroughly graded to enhance interest, convenience, and a feeling of progress. The drills are intended to improve the ease, appearance, and legibility of letters and words, and the projects offer students an opportunity to acquire considerable incidental learning.

The booklets, which are divided into yearly units, seek to reduce the bulk and to offer a wide selection of projects. They will be found to be an entirely satisfactory basic course.

The Frozen North

By Edith Horton. Cloth, 181 pages. Published by D. C. Heath and Company, Boston.

This book is a revised edition of one of the series of the Heath supplementary readers. It deals with the story of arctic exploration, beginning with the Franklin Expedition in 1818, followed by the many brilliant attempts to reach the North Pole. Thus the text recites the adventurous journeys of Kane, Greeley, Nansen, and Andrée, up to the discovery of the North Pole by Lieutenant Robert E. Peary. The progress made since that day is also described.

There is a peculiar charm about the grandeur of the icy north, the mode of life engaged in by the explorers, and the indomitable spirit of conquest manifested by brave men. The book is well illustrated.

Teaching Nutrition to Boys and Girls. By Mary Swatz Rose. 198 pages. Price, $2. Published by The Macmillan Company, New York City.

This volume is based upon the thought that the health education of children may begin with the adult but must be carried along with the children themselves if desired results are to be obtained. Thus, the author proceeds upon the accepted idea that nutrition teaching means both health and happiness for the growing child.

Attention is given to the food values of bread, milk, sugar, vegetables, fruit, and meat, demonstrating the calories contained in each. The lessons deal with the several meals each day to be given to children.

The author devotes much space to the effect which different kinds of food cause in the growth of animals, such as dogs, pigs, rats, and the like.

A table enumerating the calorie values of the common food materials is found at the end of the book.

Uniform Accounting System for South Dakota Schools. Bulletin No. 2, 1931. Issued by E. C. Giffen, State Superintendent of Public Instruction, Pierre, S. Dak.

Superintendent Giffen has rendered a real service in developing this uniform accounting system for South Dakota. In general, it follows the principles and standards set up by the United States Office of Education and the National Association of Public-School Business Officials. In addition to a complete set of forms, Mr. Giffen has outlined a procedure for handling accounts as prepared, definite systems for the distribution of expenditures, and has developed a standard outline for an annual school budget.

Song Plays for Little Children. By Mae B. Higgons. Cloth, 44 pages. The John Day Company, New York City.

Twenty songs for use with song games and folk dances are included in this collection of original material. The songs are suitable for use in kindergartens, children's play festivals, and school entertainments.

Graded Sentences for Analysis. By Mary B. Rossman and Mary W. Mills. Cloth, 110 pages. Price, 50 cents. Noble and Noble, New York City.

Sentences illustrating every possible grammatical principle are here presented in groups for drill and review.

Two Experiments with Work-Type Reading Exercises in Ninth-Grade Work. By Paul B. Jacobson. Paper, 85 pages. Bulletin No. 5, March 15, 1933, issued by the University of Iowa, Iowa City. The teaching of reading has been recognized as one of the prime functions of the school for decades. The reading lessons in this experiment were concentrated on four of the major skills; namely, comprehension, organization, location of material, and remembering. In the solution of the actual problem, two experiments were formulated and carried out to completion. In the first, four ninth-grade classes in English were divided into experimental and control groups, and in the second, the groups were subjected to an extensive measurement program which consisted of standard and objective tests of reading comprehension and knowledge. The data warranted the conclusion that giving reading instruction in the field in which the content is to be mastered is superior to giving it in another field and expecting the ability to transfer it to a content field. It implies that further investigation to determine the effect of similar work-type reading exercises in the various subject-matter fields of the high schools should be undertaken. Other investigations with different types of reading exercises in various fields may well be undertaken. This type of investigation, it is suggested, may be adapted to the needs of pupils.

The Disposition of School Bond Issues and Special Levies in Ohio Cities and Villages, for the period of November 8, 1932. Compiled by T. C. Holy and W. E. Arnold. Issued by the Bureau of Research, Ohio State University, Columbus. The report gives the results of the bond issues for cities and exempted villages for a period of five years. The report shows that 76.2 per cent of the special levies in districts qualifying for state aid carried, while only 44.6 per cent carried in nonstate-aid districts.

A Summary of Work Done by the Division of Schoolhouse Planning, July 1, 1931, to June 30, 1932. By J. B. Calhoun and J. C. Russell. Published by the Division of Schoolhouse Planning, Nashville, Tenn. A tabulated summary of the work done by the Division during the fiscal year ending with June 30, 1932. The report describes the four types of plans furnished by the Division, tells how the building requirements are developed, describes the consolidation projects, the conferences with school officials, the revision of plans, and the results of inspections.

How to Study. By Frank A. Scott. Paper, 12 pages. Issued by the Belmont Public Schools, Belmont, Mass. The articles included in this pamphlet were prepared for the purpose of assisting parents in the direction of their children's habits of study. The articles take up the topics of when to study, the use of aids in study, how to study, and the purpose of examinations. The teacher will find this material of great help in teaching pupils how to study.

A Digest of an Experimental Study of the Educational Influence of the Typewriter in the Elementary-School Classroom. By Dr. Ben D. Wood and Dr. Frank N. Freeman. Paper, 19 pages. Issued by the Typewriter Educational Research Bureau, 230 Park Ave., New York City. A digest of a work on the subject, made by the authors and published by the Macmillan Company, New York City. The authors have reported comprehensively upon the results of more than two years of experimental study of the educational influences of the typewriter in the classrooms of more than 50 elementary schools. Over 400 teachers participated in the study and the number of pupils involved reached a total of 14,949. The pamphlet discusses the general conditions surrounding the experiment and reviews briefly some of the major developments in the Wood-Freeman report.

Safety and Health of the School Child. By James F. Rogers, M.D. Circular No. 65, February, 1932. Issued by the Office of Education, Washington, D. C. A report of a self-survey of school conditions, which limits itself to essentials and economy. It seeks to provide helpful information for the grade teacher who is in need of special instruction and assistance. It indicates the time necessary to be devoted to health education in elementary schools and aims to make known all conditions, negative or positive, which the present knowledge indicates is possible for the preservation and promotion of the child's health.

THE THEODORE ROOSEVELT JUNIOR-HIGH-SCHOOL BUILDING

(Continued from Page 36)

Special Features of Construction and Equipment

All toilet and shower rooms, kitchens, etc., have terrazzo floors and cove bases. The gymnasium has an asphalt-tile floor over concrete. This floor has proved the most satisfactory for basketball games. The floors in the classrooms and special rooms are of maple. The wood trim is oak throughout.

The gymnasium, typewriting room, music auditorium, music classroom, library, and cafeteria are provided with acoustically treated ceilings to reduce the noise. The auditorium also has acoustical treatment.

Lantern outlets and screens are provided in many of the special rooms, and all the rooms are wired for radio reception.

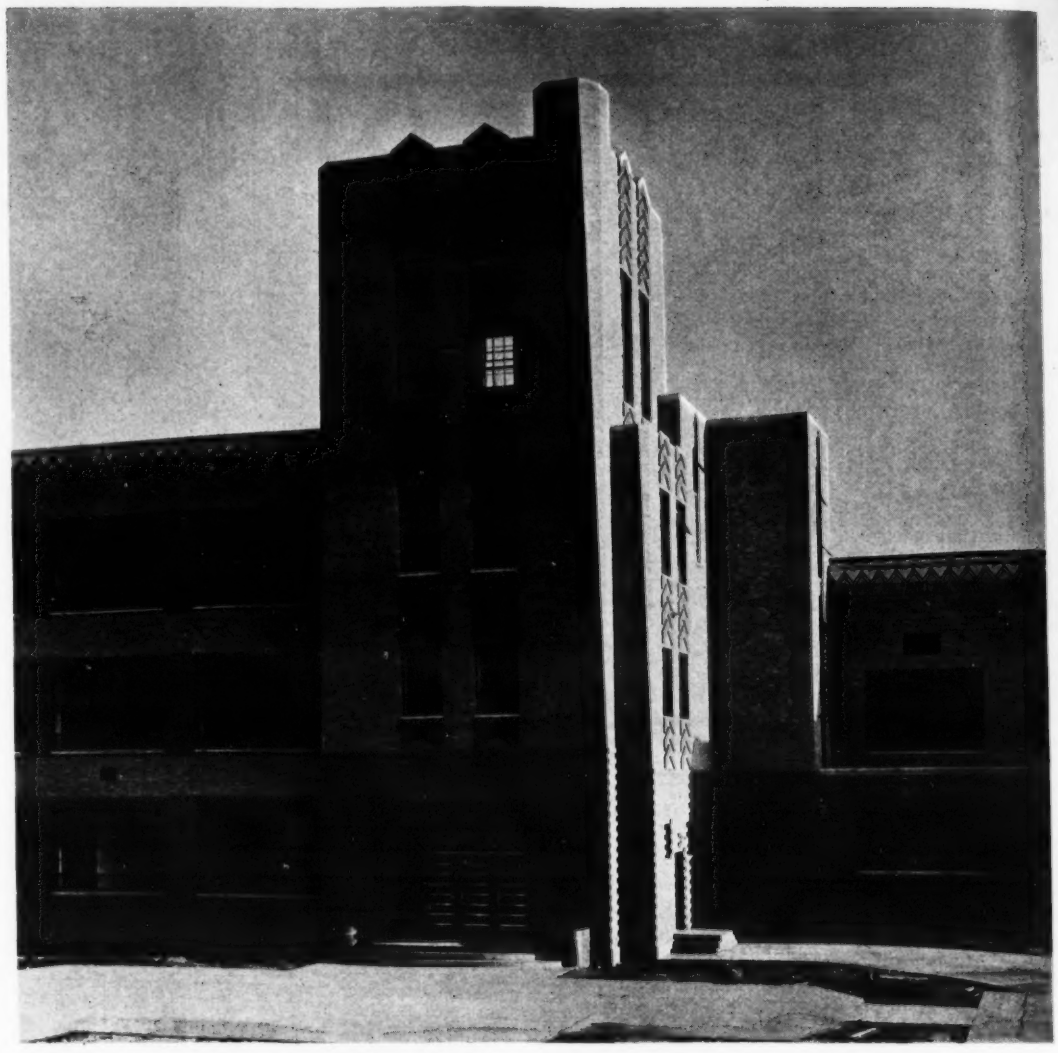
The case equipment for the special rooms was carefully worked out as a part of the architectural development of the plans, and in general provides space for the materials and work of each individual student. These cases are in all instances recessed in the walls so that the face is flush with the wall.

All classrooms are ventilated by means of unit ventilators, one located in each room. Direct radiators are also provided in each room to supplement the unit ventilators and to prevent freezing when the units are off. Both the ventilating units and the radiators are controlled by room thermostats to maintain a predetermined room temperature. An electric switch is provided in the engineer's room for controlling the fans of all unit ventilators so that ventilation can be simultaneously obtained when the rooms are occupied, or turned off when the rooms are vacated. All room thermostats have a dual function, one of a lesser night temperature when rooms are not occupied.

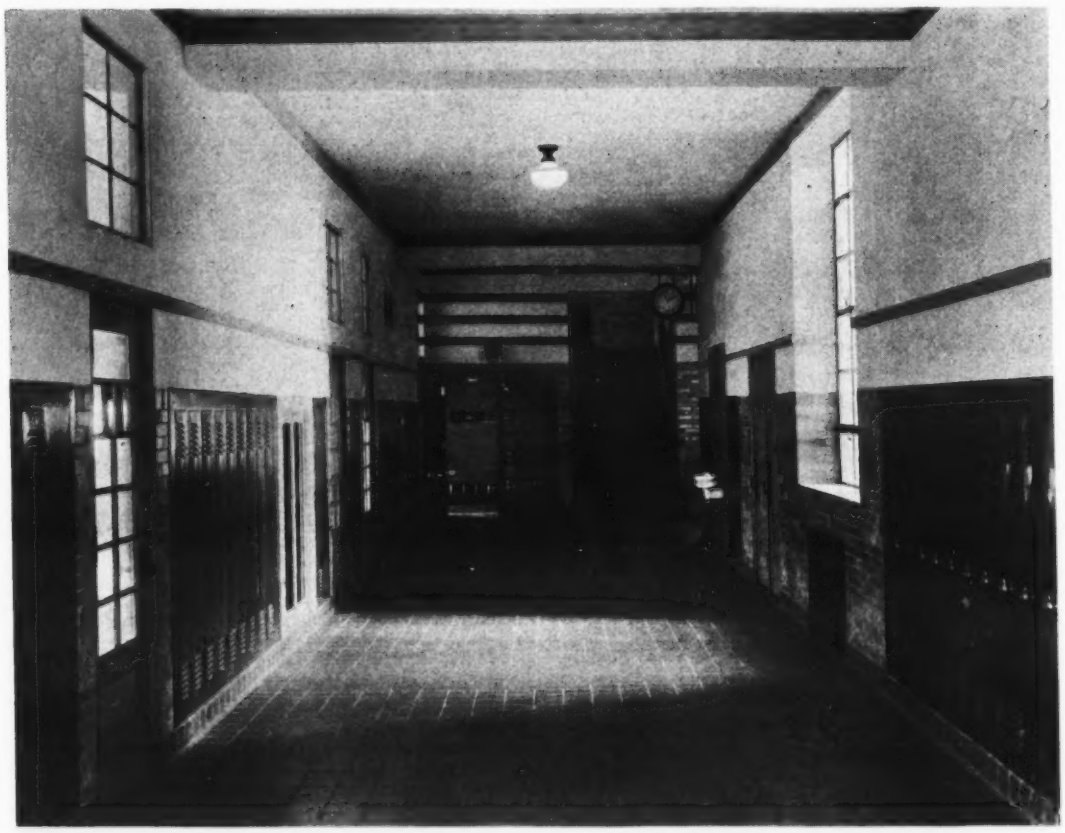
The auditorium is ventilated by a central fan through mushroom ventilators under the seats, with exhaust through grilles in the ceiling. The air supply may be doubled in hot weather over that required in the winter. Sufficient direct radiation is provided to maintain a temperature of 68 degrees without the use of the ventilating fans.

The gymnasium is ventilated by means of four large unit ventilators, two in each of the boys' and girls' sections. It is expected that in warm weather the skylights and the windows will be used. Special exhaust ventilation is provided in the laboratories, locker, and shower rooms, kitchens, and cafeteria.

The building was planned and erected under the supervision of Messrs. Hewitt, Emerson & Gregg, architects, who are also architects of the Columbia Elementary School.



DETAIL, MAIN ENTRANCE TOWER, THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS
Hewitt, Emerson and Gregg, Architects, Peoria, Illinois.



TYPICAL CORRIDOR, THEODORE ROOSEVELT JUNIOR HIGH SCHOOL, PEORIA, ILLINOIS
Hewitt, Emerson and Gregg, Architects, Peoria, Illinois.

MISSOURI INCOME TAX UPHELD

The Supreme Court of Missouri, in a decision rendered on December 16, upheld the new graduated, progressive-rate income-tax law of the state. In upholding the constitutionality of the income-tax law, the court affirmed a ruling of the Jackson county Circuit Court, in a suit brought by Langton Bacon, who sought to enjoin John R. Ranson, collector of Jackson county, from collection of an income tax assessed against him for the year 1931.

The opinion, which was given by Judge William 1. Ragland and concurred in by the six other judges, declared that "it is obvious that the tax required to be levied under it is uniform and not discriminatory, as between taxpayers in the same class. The basic principle underlying all such classifications is the ability of the taxpayer to pay."

The decision is of especial interest to the school interests of Missouri because of the sources of revenue which it opens for the schools.

MR. ANDERSON GOES TO OMAHA,

Mr. Homer W. Anderson, who was recently elected superintendent of schools at Omaha, Nebr., is a native of Wisconsin, and was educated in the schools of La Crosse. After three years as teacher and superintendent, he entered the University of Iowa for the purpose of pursuing a course of graduate study. From 1916 to 1917, was director of research at Dubuque, Iowa. In September, 1919, he became assistant director of administrative research and building program at Detroit, Mich.

In January, 1923, Mr. Anderson was appointed assistant superintendent of schools of Denver, Colo., and subsequently deputy superintendent in charge of classification, statistics, and building program. As deputy superintendent, he had entire charge of the internal administration of the schools, and for the past year and a half had supervised the junior and senior high schools and the opportunity school.

Mr. Anderson holds the B.A. degree, given by Highland Park College; the M.A. degree, given by the University of Iowa; and the Ph.D. degree, given by the same institution.

♦ Mr. William W. Covell, who had been a member of the school board of Newport, R.I., since 1905, died in December. Mr. Covell had served on the subcommittee on secondary schools and discipline and evening schools and had completed a study of endowment funds.

♦ Mr. William MacLeod and Mr. J. I. Shepley have been elected to the school board of Newport, R.I., to succeed Rev. R. W. Magoun and Mr. W. R. Harvey.

♦ Miss Nellie Whittington, president of the school board of Niles Center, Ill., died at her home on December 12, following a two-year illness.

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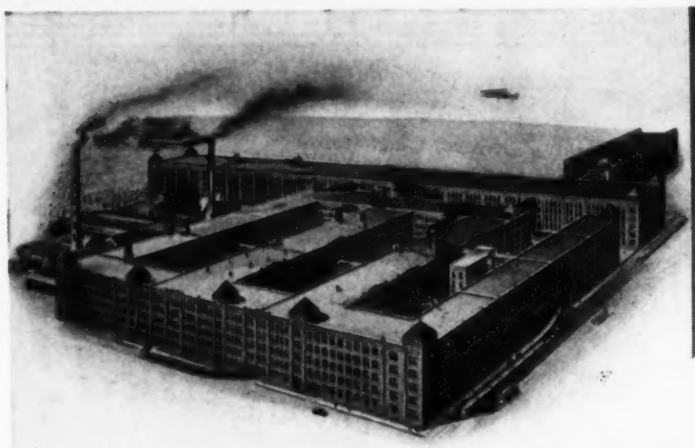

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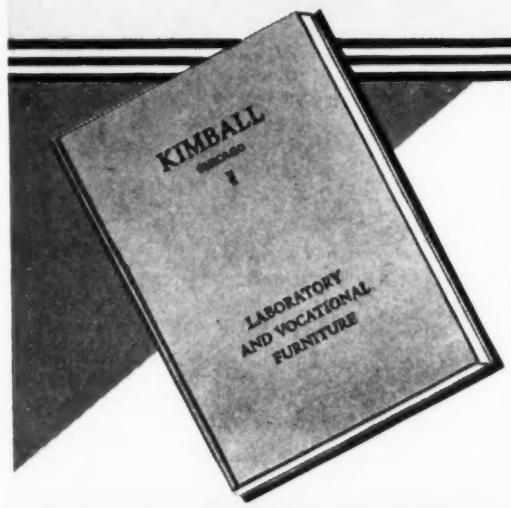

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School Board News

♦ East Providence, R. I. The school board recently voted to postpone indefinitely all automatic salary increases for teachers. It was explained that money saved through the discontinuance of the automatic salary raise will be devoted to reducing the appropriation for the next year.

♦ Campbell, Ohio. The school board has adopted a school term of nine months in place of eight, as originally planned for the current school year. The change was made after the teachers had agreed to wait for their pay in case of a shortage of funds.

♦ Chelsea, Mass. The school board has begun a study of the problem of salary cuts as an economy measure. The action was taken following an order of the mayor calling for a sliding wage cut of 10 to 20 per cent for all city departments.

♦ Chicago, Ill. The board of education has for the past four years maintained a testing laboratory through which samples of all coal for the schools must pass. Dr. David M. Bickles, of the University of Chicago, is in charge of the laboratory. All coal for the schools is judged by the number of B.T.U. given off for each cent of cost, and the contracts offer bonuses for extra heat units and penalties for those which fall below the specifications. During the four years that the laboratory has been in operation, the annual coal bill has been cut nearly 20 per cent, and a higher quality of fuel has been obtained.

♦ Oakwood, Ohio. The school board and the city council have united in a movement to hasten the payment of delinquent taxes. Data presented showed that delinquent taxpayers are responsible for the decline in tax revenue to the amount of $67,725.

♦ Northampton, Mass. Supt. F. K. Congdon has reported to the school board that the school-department expenses were reduced 7 per cent during the past year, even though the economies were in effect only a part of the time. The budget appropriation for the past fiscal year was $301,408, while the expenditures for that period amounted to $294,805. The school board voted to reduce from ten to five days the extent of sick leave for teachers. Janitors will hereafter be given five days' sick leave to conform to the schedule of teachers.

♦ New Haven, Conn. The board of education has voted to reduce its expenditures for the calendar year 1933 by $352,000, following a survey report presented to the board. The economy program contemplates a reduction in the teaching staff, a cut in school-plant expenses, and the elimination of sick-leave allowances. It was estimated that a saving of $27,000 would be effected as a result of the elimination of sick allowances.

♦ The school board of New York City has adopted a resolution, supporting a proposed change in the law making the vaccination of school children compulsory in cities to permit of exceptions when approved by health authorities. It was pointed out that medical authority favored the suspension of the law in cases where vaccination would be dangerous to health.

♦ A radical reorganization of the school administrative department of the San Francisco public schools has been recommended to the board of education by the grand jury, which has begun a study of the jury's survey report.

While the jury largely confined its three months' study to charges of business irregularities, one of the outstanding recommendations in the report is expected to call for a committee of educators from the University of California and Stanford University to overhaul the entire scholastic structure, looking to a realignment of the teaching staff.

The report which was prepared by D. F. Supple, chairman of the jury school committee, covers the entire field of school complaints. Among the subject headings which appear in the report are the following:

1. Alleged usurpation of the powers of the board by Dr. Gwinn.

2. Irrecoverable losses to the school department through irregular teacher ratings, said to run to $2,000,000 since 1925.

3. A muddled personnel department extending over many years, with charges that this department shows evidence of favoritism and discrimination in assignment and pay of teachers affecting 700 instructors.

4. Recommendations for the rehabilitation of many bureaus, including research departments, and the elimination of many, and touching on physical-education methods and costs, and inefficiency in the 36 school cafeterias, which are without a central buying head.

♦ Dallas, Texas. The members of the board of education have indicated that they will oppose any proposal to further reduce the salaries of teachers. The action was taken following a proposal by the city council to cut $200,000 from the city payroll. Mr. A. W. Spence, president of the school board, pointed out that economies have been effected which will preclude any further cut in teachers' salaries.

♦ A radical reorganization of the administrative staff of the Cleveland public schools has been proposed in a resolution adopted by the school board a short time ago. Under the proposed plan, the superintendent would be in sole charge of the school system, with three assistant superintendents having charge of the educational, the business, and the financial divisions of the schools. It is expected that the offices at present held by assistant superintendents and supervisors will be discontinued or greatly curtailed, in the interest of economy. Mr. F. G. Hogen, veteran director of the school system, was retired on January 1, after more than twenty years of service.

♦ New Bedford, Mass. The school board has adopted a resolution, providing that the 10 per cent reduction in salaries and wages of school-department employees, in effect since last July, be continued in effect into the new financial year. It was pointed out that the action was necessary to meet the payroll of the schools at the beginning of the new financial year.

♦ Superior, Wis. An opportunity center has been opened in the Blaine School, to which all superior and special-class children of the city are admitted. A special bus transports the children to the center from schools in the western section of the city. Miss Ella McGill is head of the department, which boasts of six teachers.

♦ Lynn, Mass. Radio broadcasts of the "no-school" signal will supplement the present use of street lights, fire alarms, and factory whistles. The station will make no charge for the service.

♦ The Wisconsin Association of School Boards recently discussed five proposals looking toward changes in the state's educational system. The proposals are:

1. Central state board of education.

2. Constitutional amendment to change the state superintendent to commissioner of education.

3. County boards of education.

4. Certification of teachers at a central agency and an increase in minimum requirements.

5. High-school equalization programs.

The suggestions of the association have been sent to every school board in the state for consideration and approval.

♦ Lynn, Mass. Teachers and other employees of the schools have been asked to continue their voluntary contributions of 10 per cent of their salaries to aid the city's finances during the year 1933.

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NORTH MANCHESTER *Established 1903* INDIANA

♦ Salem, Mass. The school board has voted to accept the offer made by officials of Station WNAC to send "no-school" announcements over the radio. The broadcasts will supplement the usual "no-school" signals given by the local fire whistle.

♦ Des Moines, Iowa. The board of education has accepted an offer of the Carnegie Corporation, New York City, to appropriate $120,000 for the financing of a five-year program of adult education in the city. Under the terms of the agreement, the money is to be furnished without any restrictions, and is to be administered by the board and Supt. J. W. Studebaker.

Twenty thousand dollars of the fund is available at once, and the plan goes into operation in January. After this year, $25,000 will be provided annually for the next four years.

The purpose of the plan, as outlined by Supt. J. W. Studebaker, is to organize and conduct neighborhood forums in all parts of the city where citizens can meet regularly throughout the school year. The greater part of the money will go to salaries for three full-time forum leaders to be elected by the school board.

♦ South Portland, Me. The school board recently received a report of newly projected activities to be undertaken during the next year. Among the activities proposed are improvement of the accounting system, revision of summer-school requirements, and the adoption of a proposed merit salary schedule.

♦ Long Hill, Conn. The school board recently voted to discontinue the monthly half holiday enjoyed by the school children as a result of the custom of holding teachers' meetings once a month on Monday afternoon.

♦ Providence, R. I. The school board has adopted a resolution, authorizing the superintendent of schools to obtain inspection service and insurance on all school boilers for a three-year period, at a cost not to exceed $400.

♦ Hinsdale, Ill. The teachers and other employees of the schools have accepted another cut in salary, which was brought about as a result of the shortening of the school year. The reduction was effected without seriously impairing the school system, since no courses have been eliminated, but the burden of the reduction has been assumed by the faculties and school employees.

♦ Two years ago, Supt. Wm. G. Paden, of the Alameda, Calif., schools, inaugurated the rule that all children and teachers afflicted with colds be excluded immediately. The health department now reports that the rule has assisted materially in holding down the influenza epidemic which struck the community.

♦ The oldest free school in continuous operation in the United States, the Alexandria Free Academy at Alexandria, Va., was marked with a bronze plaque on December 14. A nation-wide radio hook-up carried the news of the event to school children throughout the country. The Alexandria Free Academy was built by George Washington in 1785, and is still in use as a part of the school system of Alexandria, Va. The building is now used to house the overflow from the adjoining grade school.

♦ Decatur, Ala. A few years ago two adjacent cities were merged into one to make the present city of Decatur. The new city at that time inherited two high-school buildings and is now one of the few cities of 16,000 population to boast two senior-high-school buildings. Since they turn out considerably more than a hundred graduates each year, the abnormal overhead expense is apparently justified, according to Supt. W. W. Benson.

RULES AND REGULATIONS

♦ Monrovia, Calif. The school board has recently readopted its rules for the government of pupils in the buildings and on the grounds of the schools. These rules, as well as those set up by the principal of the high school, are given the force of law by the school code of the state. The rules adopted are as follows:

1. No pupil may leave the grounds at the noon recess or at any other time during the school day unless permission is first secured at the office.

2. Pupils driving cars to school are required to park them in the places specified, and may under no circumstances move them at any time during the school day without the permission of the principal, teacher in charge of the grounds, or caretaker.

3. Pupils are not permitted to work upon, or in any way tamper with either their own cars or any others parked on the school grounds during the school day.

4. Should any pupil drive a car on any part of the school grounds not within the area where driving or parking is permitted, he will lay himself liable to the suspension or revocation of permission to park his car on the school grounds or at any place adjacent thereto.

5. A speed limit of fifteen miles an hour shall be observed on the school driveway and all cars shall be brought to a full stop at the pedestrian crossing leading to the physical-education departments; also at the exit on Orange. The penalty for the infraction of this rule shall be the same as for Number 4.

6. Any pupils wishing to secure permission to go home for lunch must first secure from the supervisor of attendance a permit card showing the exact time when he may be absent from school, and indicating permission to use an automobile as means of transportation if such is required.

7. In order that the school premises may be kept neat and clean, pupils must refrain from throwing papers or other trash or refuse on the grounds or in the buildings.

♦ Fulton, Ill. The board of education has adopted a rule, requiring that students who engage in extracurricular activities must carry the required course of subjects satisfactorily. The ruling was made because of the increasing neglect of some of the required subjects by some of the students, and does not in any sense discourage participation in such activities.

TEACHERS' SALARIES

♦ Simsbury, Conn. The board of education in voting to protect the moral contract involved in the teachers' salary schedule, has recognized the ethical principles involved. In voting to effect a 10-per-cent reduction in salaries in conformity with the other town employees, the board granted the usual increases in the salary schedule, and the teachers were asked to make a voluntary contribution, thus keeping the salary schedule intact. The reduction has thus become a temporary expedient, rather than a permanent lowering of the teachers' salaries.

♦ The Idaho Public School Trustees' Association, at their annual meeting held in Boise, adopted resolutions calling for a new system of public education, under sound administration, with a state-wide program to take care of the common interests of the school districts of the state. The legislature will be asked to approve a plan, calling for the nomination and election of all members of the state board of education on a nonpartisan ballot, and for the submission of a constitutional amendment to eliminate the conflict of constitutional and executive authority in the state education department.

♦ Gloucester, Mass. The school board has voted to ask school teachers and other employees of the school department to make a voluntary contribution of 10 per cent of their salaries for the fiscal year, beginning December 1. The school board was of the opinion that the present salary schedules should not be continued next year unless the conditions warranted.

♦ Somerville, Mass. The school board has adopted a rule, providing that no evening high or elementary teacher may serve more than three consecutive years. After three years have intervened, they may be elected to serve another three years.

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LIQUA-SAN "C"
40% Concentrated Liquid Soap

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The economy of Liqua-San is found in its concentration. Every drop contains 40 to 42% of actual soap. The cost of transporting water, which is a contributing factor to the price of ordinary liquid soaps, is not included in Liqua-San "C". The water is added by you. In this way your school makes its own liquid soap of any desired dilution at the price it can best afford to pay.

Liqua-San "C" is made under strict laboratory control from Edible Cochin Coconut Oil. It contains no fillers or impurities that are wasted in washing. Every drop of the creamy lather is active. There is no waste.

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FINANCE AND TAXATION

♦ Woburn, Mass. Supt G. I. Clapp recently reported to the board of education that a balance of $38,719 remained in the school-department account. He estimated that the payroll for the remainder of the year would amount to $37,010, which left a balance of $1,709 for light, heat, transportation, and other items of school expense. The total appropriation allowed the school department at the beginning of the year was $298,663, which was $16,500 less than the amount asked for in the budget which had been curtailed previously by $15,000. The saving was accomplished by drastic economies in the schools, the closing of the school auditorium, the consolidation of classes, a reduction in the teaching staff, and substantial savings in paper, light, and heat.

♦ Decatur, Ala. The city school system is operating under great financial difficulties this year, due to the fact that more than half of the state funds for last year and all of the funds for this year have not been received up to December first, by the school treasurer. The board of education decided to operate the schools for one semester at least and to wait until funds are available to continue the schools, or until some method of financing has been evolved. The schools were operated on public subscriptions for two months during the past year.

♦ Toledo, Ohio. The school board has adopted a resolution, directing the preparation of a financial survey of the outlook for income and expenses during the school year 1933–34. The resolution was presented following the adoption of a recommendation for a survey of possible economies outside of contractual expenses for the remainder of the present term. It was estimated that a deficit of $170,000 would exist in January, 1933, and that the school year ending in June would bring the total deficit to more than $500,000.

♦ Columbus, Ohio. Teachers and school employees recently received three fourths of their monthly salary, due to a deficit of $50,287 in the general revenue fund of the school board. The deficit in funds was attributed to delinquent intangible tax returns which amount to approximately $63,000. The remainder of the salaries will be paid to the teachers as soon as the additional money is available.

♦ Akron, Ohio. In the face of a depleted school fund, the school board has announced that the public schools will be reopened in January and will be operated without funds as long as possible. Only two pay days for teachers were assured in January, but the teachers have offered to teach without pay if assured that they will be paid by the end of the school year.

♦ Rockford, Ill. The school board has approved an extra vacation period for teachers, as a means of saving approximately $55,000 in operating expenses. The Christmas vacation was extended from January 2 to January 9, and the schools were also ordered closed from April 7 to April 17. While the pupils lose only seven days of school as a result of the economy, the teachers lose two weeks' pay. School-board employees were also ordered to take vacations without pay during the first week in January and the week preceding Easter Sunday.

♦ Duluth, Minn. The school board has taken up the matter of economies in school operating expenses in order to effect an additional saving of $20,000 in the budget. With operating expenses already cut to the minimum by the board, it was believed the saving would have to be made in the payroll item.

♦ Recommendations for budgetary control of school expenditures were approved recently by more than 100 of the educational leaders of the State of Washington who had met to discuss school-finance problems arising through the enactment of the 40-mill property-tax-limit law.

The conference was called to obtain a report from the advisory commission on education which had been appointed to make a study showing how the tax-limit law would effect an $8,000,000 reduction in the total annual school revenues. State Supt. N. D. Showalter argued that the reduction would practically cripple the state's public-school system. The conference adopted recommendations proposing budgetary control and the Showalter equalization plan under which the state would raise 50 per cent of the school revenues, the counties 25, and the school districts 25.

♦ Bridgeport, Conn. The school board has voted that married-women teachers, able to live independently of their salaries, shall be dropped from the school system at the end of the school year in June. The action was taken as a measure of economy and is a part of the retrenchment program which the board has adopted.

♦ Manchester, N. H. The school board has adopted a tentative budget of $730,000 for the school year 1933–34, which is slightly in excess of the amount allowed last year.

♦ Muncie, Ind. The additional cut of three cents in the city school-tax rate, ordered by the state board of tax adjustment, has caused a reduction of more than $14,000 in the budget for operating expenses during the next year. The state board ordered that the reduction be made in the special tax fund.

♦ Superior, Wis. The city council recently made a reduction of $15,440 in the school-tax levy requested by the board of education. The reduction was made despite the fact that the school board had already ordered a cut of $84,073 in its budget estimate. No definite plans have been made for meeting the reduced budget.

♦ The Wisconsin Department of Education has recently announced that a cut of 12 per cent has been made in the amount of state aid to schools.

♦ Janesville, Wis. The board of education has received a report, showing that the school year ending with December 31 was closed with a balance of $3,500 in the treasury. The saving was effected largely through various economies in school operating expenses and was brought about in the face of a deficit of $2,759 in school funds at the start of the year. In addition to the balance in the treasury, there is a check of $2,700 for township tuitions, bringing the total balance on hand to $6,300.

♦ Elmira, N. Y. The school board has adopted a budget, calling for an appropriation of $337,000 and for a tax of less than $8 for each $1,000 of assessed valuation. The board has voted to operate this year on a pay-as-you-go basis and will endeavor to retire $90,000 in bonds on a schedule which calls for payment in 1936 and 1937, at a rate of $45,000 each year.

♦ Syracuse, N. Y. The school board has undertaken the preparation of its budget for the year 1933. An effort has been made to keep within the $3,750,000 budget estimates for this year, without a deficit. The school board is making an effort to comply with the demands of the mayor for a reduction in school expenses. It was the opinion of the board members that the present budget figure cannot be reduced without radical curtailment of present school activities.

♦ Manchester, N. H. The school board has approved a budget request, calling for an appropriation of $735,000 for the school year 1933–34. The largest item in the budget is $674,468 for salaries. The next year's estimates are $85,306 below those of the past year and $10,000 more than was appropriated to the department during the year.

♦ Pueblo, Colo. The school board of District No. 1 has adopted its school budget for 1933–34. The budget, which is $94,000 less than last year and $135,000 below that of two years ago, is intended to meet a 25-per-cent loss in revenue through lowered real-estate valuations and a reduction in taxes. The saving effected is largely in overhead expenses, but a reduction of 8 per cent in all salaries has been made.

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WE'LL assume, for the moment, that you have just purchased a new school bus. With paint and metal glistening, mechanical parts functioning smoothly, and the name of your school district emblazoned on the side, your bus is ready for its initial trip.

Whether it will look as well next year, and whether it will function as smoothly during the years that follow, depends entirely upon what has gone into its construction.

If it's a Mack, you can say good-bye to your worries for years.

Mack QUALITY, built into every Mack School Bus, results in a trouble free vehicle life, far beyond that of the ordinary bus, thereby spreading the slightly higher first cost over many added miles of profitable service.

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THORNE AUDITORIUM — A DEMONSTRATION IN ARCHITECTURAL ACOUSTICS

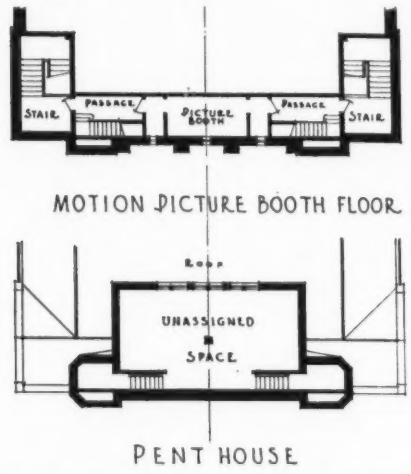
(Concluded from Page 40)

cent; draperies 1 to 8 per cent; to highly efficient absorbency construction substances up to 70 per cent. A human being fully clothed represents 4.5 units of absorption, and it is a development in acoustical science which now provides sound absorbent seats approaching the equivalent of 3 against 4.5 for occupancy. Hearing conditions thus can be made good in rooms less than half occupied. Orchestral rehearsals are satisfactory and artists have try-outs in comfort in empty rooms.

"The first step in achieving good acoustics is to know what you want," states Mr. Smith. "Such problems are subject to architectural control. Sound problems, whether they relate to extraneous factors or to 'impurities' of tone from imbalance within the room, must be laboriously dealt with. The location of Thorne Hall gave us few difficulties as to outside noises. It is situated on the lake front and in a quiet district. Its steam is piped in from a central heating plant, and the control room within the building is adequately isolated for vibration or other transmitted noises. The two auditoriums are isolated and treated as independent problems.

"Good acoustical effect within the large auditorium is favored by the proportions of the room. The stage (the point of presentation of sound) is most highly resonant. Absorbency of sound increases progressively from front to rear until, theoretically, no sound at all throws back from the rear of the room to the platform. Theaters should be ventilated with air currents directed toward the audience and away from the stage.

"The problem here was complicated somewhat by the requirement of open forums that conversational tones of men or women anywhere on the



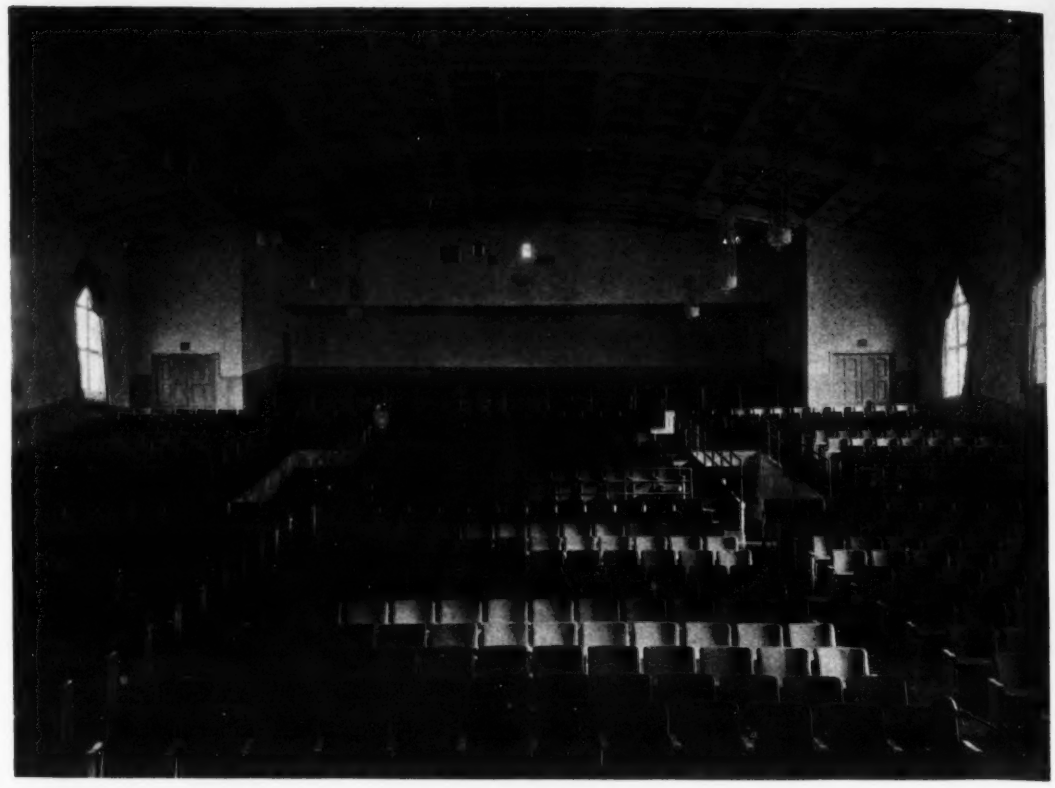
GEORGE R. THORNE HALL, McKINLOCK CAMPUS, NORTHWESTERN UNIVERSITY, CHICAGO, ILLINOIS

floor must be audible throughout the room. Orchestral music is a feature. Sound perception must be adequate and pleasing whether piccolo is playing or great diapason tones are issuing from the organ.

"Music requires greatly more resonance than does the speaking voice. Movable panels allow for precision in final adjustments of room conditions. Acoustical materials have been utilized scientifically.[1] Any corrective not included in the architect's precalculations requires a word of warning against numerous popular measures repeated endlessly but having no value whatsoever. The former popular reliance upon fortuitous wires strung here and there to ensnare an echo is a case in point. These things are useless, and false ceilings for ornamental domes put in as aftermaths of construction are costly makeshifts for initial acoustical design.

"We set the optimum reverberation time for this room at 1.5 seconds, and achieved it in the architectural planning. The procedure in sound control is scientific. We have the decibel as the accepted unit of measurement for sound intensity. Recording instruments make a permanent record of conditions

[1]About 4,000 square feet of acoustical material has been applied.



INTERIOR VIEW LOOKING EAST, GEORGE R. THORNE HALL, McKINLOCK CAMPUS, NORTHWESTERN UNIVERSITY, CHICAGO, ILLINOIS
James Gamble Rogers, New York, and Childs and Smith, Chicago, Associated Architects.

studied. The decibel is usually applied to the measurement of extraneous noises. The decibel is the smallest difference in sound intensity which is discernible by the acute ear. The average person is able to detect differences not below 2 or 3 decibels. Music ranges in intensity between 40 and 70 decibels. Elevated railway traffic registers between 68 and 83 decibels. Noise on a residence street registers up to 73 decibels. An airplane motor 10 feet away represents 110 decibels, and 130 decibels becomes an unendurable noise.

"Within an inclosed space the problem is to see that coördinated sounds are properly received by every person in the audience. Reverberation times are measured. The reverberation periods in Thorne Auditorium were worked out in accordance with the W. C. Sabine formulae for the cubical content contemplated. One and one-half seconds reverberation period was set as the optimum with the room one-third to two-thirds occupied. Care was taken to create no unusual problems by factors of design. All unusual curves of proscenium arch, balustrades, boxes were eliminated. Recessed spaces and galleries were omitted. The final tests showed a reverberation time of 1.8 seconds with the room one-third occupied, and 1.5 seconds when two-thirds full.

"This result is as close to the predicted condition as could be looked for. It is chiefly interesting as the effect is achieved at no sacrifice of architectural line, rhythm, ornament, or balance. The required curve of the relatively low ceiling is right externally from the viewpoint of architectural optics. The functional plan which segregates stages and accessory rooms at the west portion of the building with tiers of lobbies and checkrooms in the front at the east gives external masses in dynamic balance, and the whole is in perfect accord with recent trends in well-planned buildings of this kind.

"The George R. Thorne Hall is a lucid expression of modern principles of design. It is efficient, complete. The windows serve their logical purpose as areas of lambent light. The amber tones afford a good setting for the metalcraft panels dedicated to the schools of medicine, dentistry, law, commerce, journalism. The Linden Company designed the windows. The window drapes are necessary screens for light when moving pictures operate in the daytime. They are self-tone colors with the antique ivory walls. The ceiling is decorated after design by Miklos Gaspar in high colors which have been starched down to bind together the color range within the room from wood browns of the stage paneling to the lovely blue-green upholstery of the sound-absorbing seats. The lighting fixtures are lovely, but quite unobtrusive. They are carried out in crystal and translucent metal in the modern manner after designs by E. J. Cole, Chicago. The entrance vestibules are plainly treated with travertine marble wainscot and floor. The only note of color is at the cornices. A memorial plaque of George R. Thorne, in whose memory the building stands, occupies a place of prominence in the entrance lobby. This plaque is the work of Leonard Crunelle, sculptor."

NEW STANDARDS FOR SCHOOL LIGHTING

(Concluded from Page 41)

Auditorium: Emergency Lighting Requirements

"In schools having an auditorium or assembly room seating over 150 people and with provision for artificial lighting, the corridors, stairs, exit lights, and exit signs, shall be on separate circuits controlled from a point outside the auditorium or assembly room. In addition, the exits from rooms and all passages to the exits of the buildings shall be indicated by adequately illuminated exit signs."

ADMINISTRATION

♦ The administration department of the public schools of Monrovia, Calif., is issuing during the current school year an administration bulletin which is regularly sent to the parents of all high-school students, to teachers, board members, service club members, and to a selected general list of readers.

In connection with the publishing of the bulletin, an effort is made to report some of the timely and worth-while activities and policies of the schools in a brief but interesting manner, and to make the bulletin helpful, attractive, and inexpensive.

The bulletin is printed in the high-school printshop. The first two issues of the bulletin have met a fine response and have justified the faith of the school authorities in a project which will make for the development of understanding and coöperation between parents, the schools, and the community in general.

♦ Monrovia, Calif. Since September, the pupils and teachers of the high school have followed a modified daily school program. The new program provides for a class period of 55 minutes; a session or homeroom period at the beginning of the school day; for the elimination of the double-period classes for manual and laboratory work; and for a double lunch period, providing for the serving of half of the school in each of two shifts in the cafeteria. The lengthened class period gives time for supervised study and for a preview of the lessons of the next day. The 30-minute homeroom period offers better opportunity to advisory teachers, giving time for the carrying out of certain student activities, and providing a brief study period for many pupils.

"Cheap floor treatments are the bunk!"

● "We saved $85.00 on our floor treatments last year," reports a disillusioned superintendent, "yet our total floor maintenance bill jumped about $350.00. Cheap floor treatments are the bunk!"

Figure it out for yourself. If a floor treatment costs $2.50 a gallon and wears for 2 months, you certainly don't save any money by buying a treatment at $1.25 a gallon that lasts only 1 month.

And that's what happens 9 times out of 10! As a matter of fact you lose money because you have to pay for the labor of two applications . . . and labor is a big item in the floor maintenance budget.

Tri-C Floor Treatments are economical not only in first cost, but total cost. They are compounded of quality ingredients selected not only to give maximum coverage but greatest durability as well.

Furthermore, Tri-C products are sold by men who are qualified floor engineers . . . men whose unique experience enables them to capably diagnose your particular floor problems and to recommend the program that will give the maximum ultimate economy. Their services are at your command.

TRI-C PRODUCTS

CAR-NA-VAR

The original varnish gum and wax floor treatment combining the durability of varnish with the pliability of wax. Gives a beautiful waterproof finish.

RUBBER-VAR

Rubber-Var is made of the same solids as Car-Na-Var, is but liquefied by thinners harmless to rubber. It is also non-slippery and waterproof.

CONTINENTAL "18"

A scientifically prepared emulsion of 18% wax and gums for most floors. Dries with a hard, bright finish without polishing. Non-slippery and water-resisting.

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dry clean WITH TRI-C

GUARANTEED FLOOR MAINTENANCE MATERIALS AND EQUIPMENT

free "Check-up" Chart

Don't scrub! Don't wax! Save money by "dry-cleaning" your floors with Tri-C products. Send for free "Check-up" Chart and get the facts and figures on your building.

CONTINENTAL CAR-NA-VAR CORP.
1811 National Ave., Brazil, Indiana
Without obligation send me free "Check-up" Chart and further details about "dry-cleaning" our floors with Tri-C products.

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In keeping with restricted 1933 School budgets the SOLAR SYSTEM OF WASTE DISPOSAL will effect drastic economies in School cleaning.

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We have prepared interesting information for School Executives on how SOLARS accomplish cleaning savings and at the same time increase School Sanitation.

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MAT REPLACEMENTS *WITH*
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(IN COLOR DESIGNS)

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MADE ALSO IN TAN CORRUGATED LEATHER FOR INSIDE USE IN VESTIBULES, CORRIDORS, ETC.

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HILD FLOOR MACHINE CO.
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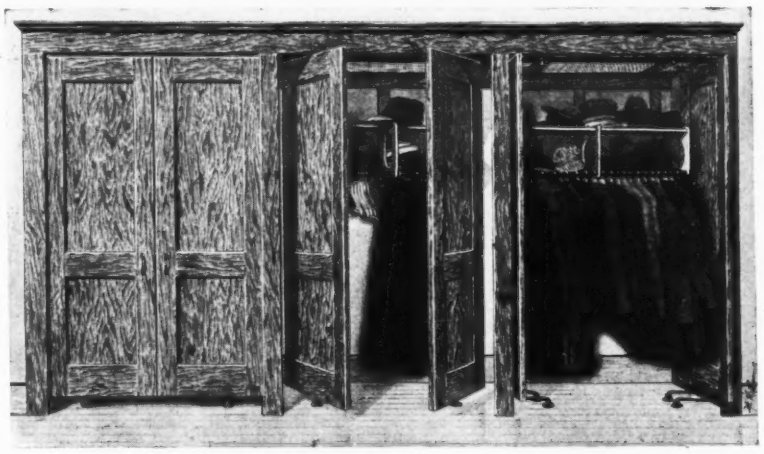

EVANS
"Vanishing Door"
WARDROBE

●

Class J
equipped with either "Floor" type (as illustrated) or "Jamb" type hinges. This is Class D wardrobe if made with flush doors.

CLASSROOM WARDROBES

High in Quality — Low in Cost

This type occupies a recess flush with the wall. Plaster back and ends. No partitions, but with mullions between pairs of doors. Wire mesh ceiling. Blackboards if required.

The "Vanishing Door" hinges on which the doors are hung are made with double pivoted arms and swing the doors back into the wardrobe entirely out of the way. Simple—trouble-proof—and last as long as the building.

Wardrobes are furnished complete in the knock-down, with all woodwork cut to size, and only need to be nailed in place. The hinges are easier to put on than common butt hinges. The cost of installation is small.

We make many other types of school wardrobes, fully illustrated and described in Catalog "M." Send for your copy.

W. L. EVANS

WASHINGTON, INDIANA, U.S.A.

1933 resolution no. 1

No. 48 Flange rests on desk top.

No. 49 Rests flush with desk top.

Spot the *big-little* economies that help meet low budgets

Take inkwells, for instance. Little things. Yet in a year's time, what a surprising replacement bill they can roll up. Don't you know? (Or *do* you?)

Resolve that such bills won't muscle in on your slim funds in 1933. Send for free samples of the Sengbusch all-hard-vulcanized rubber inkwell — try them out — compare them with those you have been compelled to use in the past — and then, if they fulfill all claims made for them, *standardize* on this practically non-breakable well.

Other schools have followed just this procedure. Their repeat orders represent concrete evidence of the satisfactory service rendered by their original trial installation.

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WEBER COSTELLO CO.
CHICAGO HEIGHTS, ILLINOIS

SCHOOL SURVEYS AND SCHOOL-BOARD PLANNING

(Continued from Page 20)

3. Without unnecessary detail, it presents in clear perspective all of the essential facts and factors that will prove serviceable in justifying existing procedure or in solution of new problems of interest and concern, such as a change of school boundaries, the adoption of a new or modified type of school organization, the location of sites to be acquired for future needs, the formulation of a building program, the introduction of some new method of instruction, the imitation of a new or modified system of business administration.

4. Its form is direct, clear, intelligible, logical. Simple graphic representations are used to render comparisons more impressive and for special appeal to those who are eye-minded.

5. Its tenor throughout is constructive in character and effect, never captious.

6. It bears upon its face evidence of thoroughness and accuracy.

7. Inasmuch as the value of a survey depends upon the practical use that is made of it, it is highly essential that the survey proper be followed by a prescription or prospectus based upon it. While, strictly speaking, not a part of the survey, it is a sequel of such great moment that it should form a part of the report. A satisfactory report, therefore, presents a carefully elaborated summary or exposition of the application that is to be made of the findings. This summary should bear the earmarks of painstaking study of the entire situation and of full collaboration.

Economy as a Practice

The popular cry of the hour is "Economy!" Let us voice the hope that good will come of it, for economy is a virtue of such eminent desert that it should be practiced all the time, everywhere. It must be acknowledged that its importance in the educational field is peculiarly pertinent and obligatory, not alone because of the amount and extent of the interests involved but because it should be taught in the schools as well as practiced there. Waste should be denounced in unmeasured terms and condemned wherever practiced, especially in the school.

Economy, however, is not parsimony as one might naturally infer from what is often said and done about it. The two terms have nothing in common. Economy is "management without waste or loss." Rightly practiced, it gives maximum returns for money, time, and energy expended. Parsimony scants and stints. It thereby diminishes and impairs returns; and this is a procedure that is destructive not constructive, hurtful not helpful. Failure to meet needs, therefore, because of the injection of parsimonious practices does not result in economy but in loss and waste.

Economy is not a spontaneous or an intuitive endowment. It is a virtue that must be sought, cultivated, and developed. It is the result of a process, not of a single act. It is an attainment, the outgrowth of well-directed effort, of continuous, persistent, systematic endeavor. In great and important undertakings, it requires intensive study, expert research. There must be thorough investigation to discover and unfold the needs with definiteness and accuracy. Then there must be skillful planning to develop plans, elaborate programs, and devise the best ways and means to meet the needs with a nicety of precision and adjustment that admits of no waste or extravagance. The third all-important step is the execution of the plans with utmost thoroughness, competency, and precision. Hence the desired goal is not to be reached by the diminution, curtailment, or elimination of any essential activities, but rather by maintaining and conducting them in a way and manner to secure maximum returns for the expenditures in whatever terms expressed or measured.

As set forth at the beginning, the application of these principles to education is of peculiar and significant importance for three reasons: (1) The expenditure is far greater than for any other civic interest. (2) The magnitude and importance of the work is beyond comparison. (3) The schools should be an example of Democracy at its best.

Using Our Heads

We have been passing through one of those epidemics of mass excitement and hysteria that recur periodically. The present experience though less critical and more senseless than the usual run, despite current opinion, is characterized by the same extremes to which people go, the same foolish things they say, do, and advocate in such crises.

Even we school-board members, with all our reputation for deliberation, discrimination, and self-control, have not been entirely free from it. Forgetful that the DEPRESSION is the creation of grown-ups and should be met by them, some of our number have gone so far as to lay deliberate plans to unload as much as possible of it on the shoulders of children. Forgetful that in this greatest of all democracies the child has an inalienable right to the free enjoyment of full educational opportunity, some of us have trimmed down teachers' salaries, reduced the teaching force, cut out courses of instruction, and done other hurtful things. Unmindful of the fact that education for citizenship is at once the foundation principle of our republic and the corner stone of our educational system, some have even gone so far as to shorten the school day and the school year, and to close the doors of school opportunity to those to whom it has been open heretofore.

Education on the streets and in the alleys instead of in the schools! Raising millions to give men and women work and closing million-dollar schoolhouses to the young when there is no other work for them to do! A country with a record of more than $10,000,000,000 a year for luxuries now robbing children of educational opportunity! These anomalies

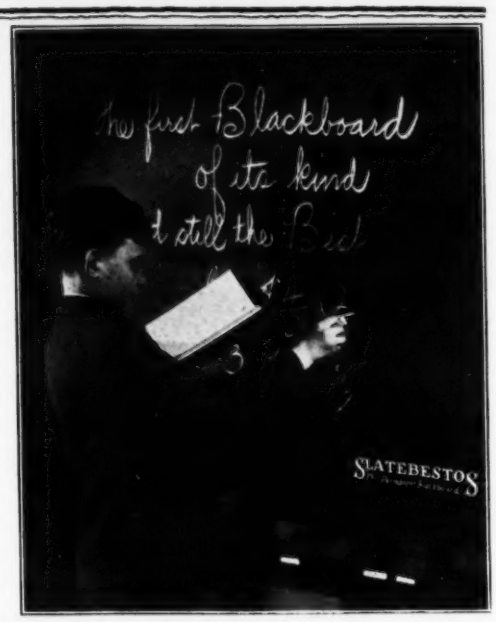
A Good Blackboard Saves Good Sight!

SLATEBESTOS is the ideal blackboard from every standpoint. It is a *built* blackboard and everything has been put into its manufacture to provide for rapid, legible writing and for satisfactory, lasting service.

But above all, its smooth, velvety writing surface is permanently non-reflective, preventing eyestrain. Youthful eyes should be protected from glossy, shiny or gray blackboards.

Besides—SLATEBESTOS is economical—it will last the life of the school building.

Samples and further information gladly sent to educators, school board members and architects.



Peerless Map and Bulletin Rail

Made of heavy steel, finished in durable dull brown; eliminates the necessity of driving nails, screweyes or hooks into the moulding or wall; furnished with, or without, cork lining. Removable, sliding hooks are provided which may be spaced at will. Each hook is equipped with a leg, carrying a steel spring clip for attaching printed matter, drawings, pictures, etc.

Write for sample and full information.

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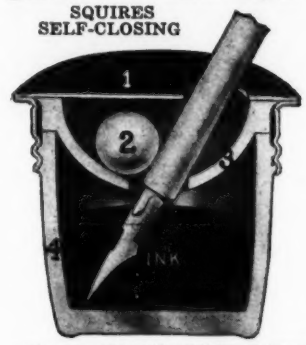
SQUIRES INKWELLS

We manufacture the Boston Inkwell in three different styles. All have hard rubber tops and the glasses fit either style of top. These fit 1 27/32 inch holes.

SQUIRES SELF-CLOSING



No. 14. BLACK RUBBER TOP FITS A 2 INCH HOLE

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SQUIRES No. 60 BOSTON INKWELL

SQUIRES No. 12 COMMON SENSE INKWELL

Our No. 12 or Common Sense Inkwell is made in three sizes, to fit holes 1½", 1¾" or 1⅞". Corks with Caps or Rubber Corks furnished as desired.

We make several other styles of inkwells.

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can be charitably charged only to temporary aberrations and not to normal states of mind.

When we face the present situation with due calmness and deliberation, will we not find that this is a time that urgently calls for best thought and utmost effort in the formulation of plans for better schools, for increased school facilities, for wider opportunities for the young that they may avoid the pitfalls into which we have fallen? Is this not an auspicious time to practice thrift and economy by the full utilization of existing facilities and the development of well-considered, prudent, and sagacious plans for additional facilities wherever needed? If a new building, more apparatus, and better equipment are among the needs, it would seem that the preliminary work incidental thereto should certainly be done in season to take advantage of the unusually low costs of labor and material by being in readiness to let contracts before there is a substantial increase in costs. There is now, indeed, a rare opportunity to practice economy and at the same time promote the welfare of the school child.

All in all, this is an exceptionally important time for us school-board members to use our heads and a most inopportune one to lose them.

THE NEW STANDARDS OF VENTILATION

(Concluded from Page 30)

air shall be so distributed and circulated that the variation in concentration of CO_2 in the occupied zone shall not exceed one part in ten thousand. This is not a reversion to the so-called carbon-dioxide theory; it is merely a simple index of air circulation, because only under conditions of air stagnation would there be improper distribution of carbon dioxide.

The standard of air quality is required to be sufficient to maintain all the standards of air temperature, air quality, air motion, and air distribution hereinbefore referred to, with the additional proviso that not less than 10 cu. ft. per minute, per occupant, shall be taken from an outside source.

TABLE 1. EFFECTIVE TEMPERATURES RANGING FROM 64 DEG TO 69 DEG FOR VARIOUS DRY-BULB TEMPERATURES AND RELATIVE HUMIDITIES FOR STILL AIR FOR PERSONS NORMALLY CLOTHED AND SLIGHTLY ACTIVE [a]

(For use when heating or humidification is required)

Dry-Bulb Temperatures (Deg Fahr)	Relative Humidities (Per Cent)						
	30	35	40	45	50	55	60
	Effective Temperatures (Degrees)						
67						64.0	64.3
68			64.0	64.2	64.5	64.8	65.1
69	64.1	64.4	64.8	65.1	65.4	65.7	66.0
70	64.8	65.1	65.4	65.8	66.2	66.5	66.8
71	65.5	65.8	66.2	66.6	67.0	67.3	67.7
72	66.2	66.5	66.9	67.3	67.7	68.1	68.5
73	67.0	67.3	67.7	68.1	68.5	68.9	
74	67.7	68.0	68.4	68.8			
75	68.4	68.7					
76	69.0						

[a] See A.S.H.V.E. GUIDE 1932, Fig. 2, p. 394.

FIG. 1. EFFECTIVE TEMPERATURES RESULTING FROM HUMIDIFICATION OF AIR

Most of the state laws on ventilation require the introduction of at least 30 cu. ft. of outdoor air per minute, per person. In the light of our present knowledge, this minimum requirement may be excessive if the physical conditions of the air are satisfactorily maintained. Reduction of this requirement to 10 cu. ft. should effect a very substantial saving in operating costs of ventilating plants without detriment to either comfort or health.

Standards for School Buildings

The setting up of a minimum of 10 cu. ft. of outdoor air as a requirement for proper ventilation does not necessarily mean that the mere introduction and removal of this volume of air from a room will properly ventilate it. The fact of the matter is that much more than this quantity is normally required to provide air distribution necessary for good ventilation, but the additional quantity above the 10 cu. ft. may be obtained by recirculation within the room, provided outdoor temperature conditions will permit a proper heat balance to be maintained.

For rooms of normal occupancy, such as in the home, in most offices, in the guest rooms of hotels, etc., infiltration through walls and windows is sufficient to serve every ventilating need; but in schools and theaters, in places of public assembly, etc., infiltration is insufficient to provide for the elimination of odors and to maintain the proper standards of air motion and air distribution.

The Ventilation Standards of the American Society of Heating and Ventilating Engineers set up the conditions that are considered desirable, but do not attempt to describe the methods whereby these conditions may be produced. The individual designer may exercise his own ingenuity with respect to methods and is limited only to definite results. There may be several methods by which the standard requirements may be obtained. It does not follow that persons having knowledge of the standards are necessarily competent to design the methods, nor to solve the engineering problems involved. They cannot be solved by guesswork, by rule-of-thumb methods, or by political practices. Designers of ventilating systems for public schools should be selected on the same basis as educators or lawyers are selected, i.e., on the basis of competency in their profession, and not on account of their good looks or good friends.

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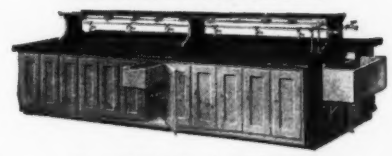
Kewaunee Furniture, besides being good furniture, is pedagogically correct in every detail; is designed to handle more pupils comfortably; is installed to permit every period use of rooms and is made to last as long or longer than the new buildings in which it may be installed.

When you consider bids for equipment, be sure you give consideration to the extra value Kewaunee gives. Estimate the value of the space it saves for other classes, the extra years Kewaunee Furniture will serve you, as well as the low price of this equipment. Catalog mailed on request.

Domestic Science Table No. BL-76



General Chemistry Table No. D-794

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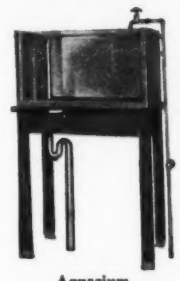
Louisville	El Paso	Grand Forks, N. D.	Spokane
Nashville	Toronto, Ont.	Aberdeen, S. D.	Crystal Falls, Mich.
Columbus	Oklahoma City	Denver	
Adrian, Mich.	Kansas City	Salt Lake City	Montreal, Que.



Aquarium No. BL-34

PERSONAL NEWS

♦ Dr. Abbott Lawrence Lowell, president of Harvard University, Cambridge, Mass., has resigned after completing 23 years of service as head of the institution. Dr. Lowell found Harvard a small institution with 3,883 students and an endowment of $22,716,759, and he left it with more than 8,000 students and an endowment of $123,415,390. Dr. Lowell had served longer than any other president with two exceptions, one of them his predecessor, Charles W. Eliot, who headed the university for 40 years.

♦ Miss Ida MacLean, formerly music supervisor in the public schools of Superior, Wis., and who has been for some time connected with Silver, Burdett & Company, has again resumed her duties as supervisor, succeeding Earl Braman.

♦ Mr. Thomas J. Condon, assistant superintendent of schools at Waterbury, Conn., has been elected superintendent, to succeed the late Michael C. Donovan.

♦ Mr. O. P. Greer has been elected superintendent of schools at Mesa, Ariz., to succeed Mr. H. E. Hendrix, who became state superintendent of public instruction on January 1.

♦ Mr. G. E. Denman, formerly principal of the East High School at Green Bay, Wis., has been elected superintendent of schools at Marinette. He succeeds C. E. Hulten, who on December 1, became superintendent at Sheboygan.

♦ Mr. Michael C. Donovan, superintendent of schools at Waterbury, Conn., died November 16.

♦ Supt. C. D. Lamberton, of Berlin, Wis., has been reëlected for another three-year period. Mr. Lamberton has completed 24 years of service in Berlin educational institutions and has been superintendent for the past twelve years.

♦ Mr. Anthony E. Karnes has been elected as Commissioner of Education for the Territory of Alaska, for a term of four years, beginning with March 1. Mr. Karnes succeeds Mr. William K. Keller. Mr. Karnes, who was formerly superintendent of schools at Ketchikan, Alaska, is a graduate of Washburn College, Topeka, Kansas, and holds degrees given by that institution and the University of California. He has had nineteen years of successful experience, from rural teacher to city superintendent, and had completed six years' work at Ketchikan.

♦ Charles W. Lyon, associate superintendent of schools of New York City, retired on December 31, after 45 years of service.

♦ The position of deputy superintendent of schools of Denver, Colorado, left vacant by the resignation of Homer W. Anderson, who became superintendent of schools of Omaha, Nebr., on January 1, is to be discontinued, according to a decision of the school board. The work of the office will be assumed by Charles E. Greene and Charles L. Cushman in addition to their other duties. The elimination of the position is expected to effect a saving of approximately $7,000 annually.

♦ Mr. Axcil Blonquist, who had served a three-year unexpired term as a member of the school board of the North Summit School District, Coalville, Utah, has been reëlected for a four-year period. Mr. E. J. Tremelling was also elected to serve a four-year period in the same district.

♦ Mr. Carl Espach, a Manhattan attorney, has recently been elected president of the school board of Elmont, L. I., New York. Mr. Espach has found time to devote attention to the community and has been an active civic leader. He is recognized as a man of unusual ability in civic affairs and is well qualified to participate in educational matters.

During Mr. Espach's membership on the school board, he has been responsible for the carrying out of a number of educational affairs of benefit to the schools. He has been responsible for the reorganization of the school system on the superintendency basis, has worked for a more efficient bus schedule, has provided for the improvement of the cafeteria organization, has worked for an improved salary schedule, has inaugurated a five-day sick-leave plan for all teachers, has instituted a rating system for teachers and principals, has established a uniform library system in the schools, has worked out a uniform system of management for the janitorial staff, has placed new blackboards and changed the seating in each classroom, and finally has effected a reduction of $18.11 per child in the cost of education, making a total anticipated reduction for the school year 1932–33 of $33,503, based on an enrollment of 1,850 children.

PROFESSOR BRIGGS SUGGESTS WAYS OF AVOIDING SALARY CUTS

Prof. Thomas H. Briggs, of Teachers College, Columbia University, speaking recently before the secondary group of the College, gave a dozen suggestions for reducing high-school budgets, ranging from economies in physical equipment to elimination of pupils who cannot or will not profit from the curriculum.

Professor Briggs, after calling attention to the widespread salary cutting indulged in by boards of education throughout the country, warned teachers whose salaries are still at par that in their appeals against salary cuts they need expect little sympathy from a public whose "ears are filled with cries of distress from all mankind." He said that the public can be made to listen to the larger argument that education must be preserved and promoted so that society may be preserved.

Economies that educators themselves may advocate, said Dr. Briggs, might include a refunding of school bonds at lower interest rates; drastic cuts in provision for physical equipments and new buildings; experimentation with larger classes; increase in the pupil-load of the teachers; use of the school plant on Saturdays and during vacations; elimination of subjects for which there is insufficient demand; dismissal of incompetent teachers; elimination of pupils "who cannot or will not profit by what is possible in the curriculum"; establishment of honors courses for bright students, where, like honor students in colleges, they may study without the close supervision of teachers; reduction in the number of required subjects; elimination from the curriculum of subjects which fail to "contribute to human welfare."

Dr. Briggs conceded that his suggestions for experimenting with larger classes and for increasing the pupil-load of teachers would not be popular. He justified the suggestions, however, on the ground that they should at least be tried in preference to salary cutting.

TEACHERS

♦ Wausau, Wis. The school board has adopted new regulations governing the paying of teachers while absent from classes. Under the rules, teachers who contract a contagious disease will be paid in full for the duration of their illness. In the case of other illnesses, teachers will be paid for five days' absence. The pay for substitutes was set at $4 a day for grade teachers, $5 for junior-high-school teachers, and $6 for senior-high-school teachers.

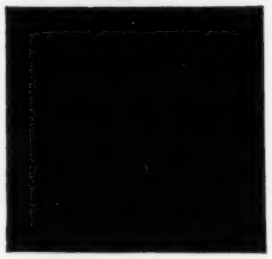
♦ Rochester, N. H. The local teaching staff has formed a club, the purpose of which is to conduct evening discussions with parents on various civic problems during the winter months. School-board members are urged to be present at meetings of the club.

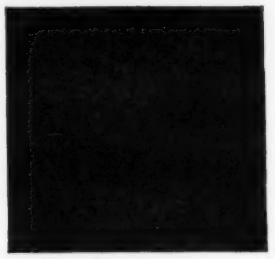
♦ Worcester, Mass. A 10-per-cent voluntary contribution of school-department salaries has been voted by the school board in connection with the adoption of its 1933 school budget. The new budget calls for an appropriation of $3,213,830, which is $26,626 more than last year. The contributions, it was estimated, would turn back $311,030 into the city treasury, an amount which is equivalent to five weeks' and one day's pay.

♦ Employees of the Chicago public schools received, on December 21, checks for two weeks' pay. A total of nearly $22,000,000 worth of warrants for teachers' and janitors' salaries are still outstanding.

SELOC GLASS BLACKBOARDS

Compare the Results





SELOC GLASS		SLATE
UNIFORM DEEP BLACK	»	VARYING COLOR FROM GRAY TO LIGHT BLACK
Easy writing because of velvet texture	»	Rough writing because of pitted texture
Absolutely non-fading	»	Not non-fading
Perfect adhesion of chalk to board	»	Imperfect adhesion
Easy to erase and wash	»	Difficult to clean
Impervious to moisture	»	Absorbs moisture

WHY THIS NEW SELOC GLASS BLACKBOARD IS SO GOOD

It is made of black plate glass—with a *suspended abrasive* uniformly dispersed throughout the glass *while molten.* Not just a top surface treatment that wears smooth and slippery, but a blackboard that is perfect *surface all the way through from back to front.* Experimental tests equivalent to *one hundred years' wear* have left *Seloc Glass* blackboards as good as new.

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Experienced placement authorities in charge of every phase of educational activity. Our work includes positions from college executives to primary and kindergarten teachers. Excellent librarians, secretaries, teachers of physical education and home economics are on our lists. Write for information.
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SLATEX—A Chemical Blackboard Finish

Renews and Preserves the Writing Surface of Blackboards

Here's a *new* preparation for renewing grey, faded blackboards. Slatex penetrates and sterilizes, giving the board a perfect finish without building up an artificial surface.

Slatex makes blackboards easy to write on—easy to read from. The work of your teachers becomes more effective. Students take a keener interest in blackboard work when they can read without squinting or eye strain.

In comparison with results, the low cost and ease of application make this process a practical one. It takes but one 8-ounce can and a half hour to SLATEX 200 square feet of blackboard.

Single can (8 oz.).....$1.50 — Case (12 cans).....$12.50

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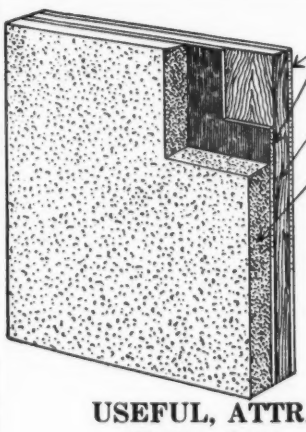

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Practical for display purposes in halls and over blackboards in schoolrooms. Easily installed in old or new buildings.

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We Manufacture All Sizes. Write for Sample.

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for the elementary school

THE ART OF THE CHILD—*A. G. Pelikan*

Price $3.00

Two distinct phases of artwork are represented in this book. The one is the expression of ideas in pictorial form without the aid of the teacher. The other is so-called construction work, in which the aim is to teach children to follow directions, to learn accuracy through actual application, and to carry through a chosen problem in a more finished manner. Illustrated by actual reproductions of students' work.

JUNIOR COLOR TABLET—*H. F. James*

Price 35 cents

A fifth and sixth grade text that shows what actually takes place when colors are mixed. The colors are blended right before the pupils' eyes. The Tablet is composed of twenty-four plates, including exercises and experiments instructing children in hue, chroma, intensity, values, color harmonies, etc.

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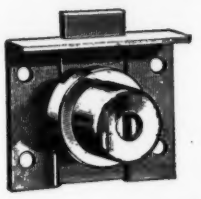
The Dudley



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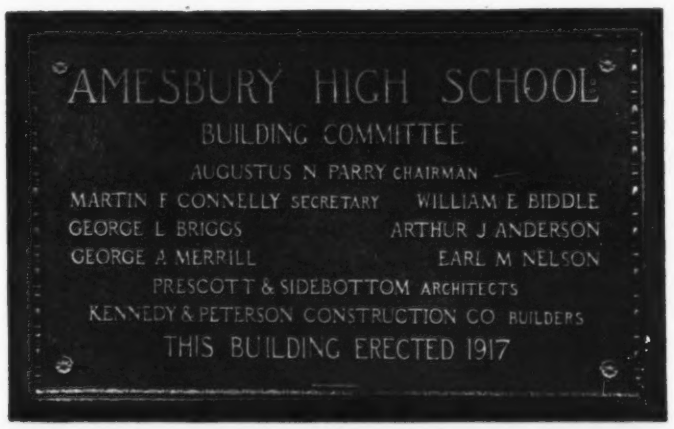

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After the Meeting

HAMLET WAS RIGHT*

A Superintendent's Soliloquy

To go, or not to go, that is the question:
Whether 'tis nobler at home to stay
And save the price of the trip,
Or to be prepared against a sea of troubles,
And by opposing, end them? To die — to sleep —
To sleep perchance to dream — ay, there's the rub;
For in that sleep, our schools do suffer sore.
If I but heed the call to Minneapolis,
Where enterprises of great pith and moment
Will be discussed to help me solve the problems of my board,
Then will I improve my schools
And save more than the paltry cost o' the trip.
With or without my fair Ophelia, I will go.

*Reprinted, with liberties, from the Bulletin of the Associated School Boards and Trustees of the State of New York.

A CHARGE TO BE MET

"We should not forget that idleness is no more helpful to children than it is to adults, and that a rigorous enforcement and support of school attendance is a vital accompaniment of all reduction of child employment — which in turn, brings us to the necessity of maintaining and supporting our schools as a first charge upon all our resources in these times of emergency." — Herbert Hoover.

Why She Was Missing

A young teacher of dressmaking was in charge of an evening class, when in walked an inspector, and asked to see the register, in order to check it. Having examined the register he counted the number of students present. Once again, very carefully, he counted, and then remarked to the teacher, "I am afraid there is a mistake in registration, there are only fifteen students present, and you have entered sixteen in the register.

The shy young teacher muttered: "It is quite right, sir," but the inspector exclaimed: "It is not quite right. Please send for the head mistress."

On her arrival the inspector pointed out the error in registration.

"Oh," said the mistress, "it is quite right. You see, one of the students was being 'tried on,' and she is now under the table." — Teachers' World (London).

The Modern View

A teacher asked the class what was meant by a man "possessed of evil spirits." After a brief pause, one youngster spoke up.

"It means a bootlegger."

If the Cap Fits

A young country teacher, according to the *Teachers World*, London, in the presence of His Majesty's school inspector, was giving a lesson on "A Pig." The inspector sat patiently. At last he could endure it no longer, so he turned and left the room. After the lesson the teacher found a scrap of paper on her desk, on which were these words: "Have you ever seen a pig? See me at playtime in the headmaster's room."

Easily Seen

"How far have you studied, Johnny?" inquired the teacher.

"Just as far as the book is dirty."

An Ancient Joke

Book Agent (to farmer): "You ought to buy an encyclopedia, now that your boy is going to school."

Farmer: "Not on your life: Let him walk, the same as I did."

THE OLD ONES ARE BEST

Teacher (shaking Johnny by the arm): I believe the devil has a hold of you.

Johnny: S-s-s-, so do I——

Not Necessary!

Stanley Baldwin, former prime minister of England, in an address of the classics and the common man says: "It is not necessary that one should understand the classics in order to love them, else who is there who could say he loves a woman?"

Mother: "Is my boy really trying?"
Teacher: "Very."

Buyers' News

PERSONAL NEWS

Mr. Petre Passes. Mr. Lewis D. Petre, vice-president of the American Seating Company, manufacturers of school desks and theater seating, was killed in an automobile accident in Chicago, on December 20. Mr. Petre was struck by an automobile while crossing Hyde Park Boulevard in the neighborhood of his home.

NEW PRODUCTS FOR SCHOOL USE

Announce New Trane Air-o-Lizer. The Trane Company, of La Crosse, Wis., has recently placed on the market its new Trane Air-o-Lizer, a unit ventilator of revolutionary type, marking a forward step in schoolroom heating and temperature control.

The Air-o-Lizer is a device which eliminates separate radiators and temperature-control apparatus and utilizes a combination of ventilating, heating, and temperature-control equipment all in one unit. It has been proved by architects and contractors as a great advance in the ventilation field.

The Air-o-Lizer consists essentially of a copper heat-transfer element, a silent fan, a dry-type air filter, and an electric damper control. The heart of the apparatus is the Trane temperature-control valve, which regulates not only the flow of steam but also operates the dampers admitting outdoor or recirculated air.

The Trane Air-o-Lizer enables schools to purchase a threefold equipment in one unit, and insures uniformity in operation and results of the three important factors of classroom ventilation — heating, ventilation, and temperature control.

The Trane Company has compiled complete technical data on the Air-o-Lizer for the use of heating engineers, school authorities, and architects. These are available on request to readers of the JOURNAL.

The New Mack School Bus. The Mack Trucks, Inc., 25 Broadway, New York City, has announced that increasing numbers of school boards are standardizing their bus fleets, by purchasing Mack school busses.

The Mack school bus is built in various capacities up to 77 high-school students or 82 elementary-school pupils. It has a substantial, low-stepped, steel body, insuring great strength, together with rigidity and lightness. The windows are of the drop-frame type, glazed with safety glass. Substantial bumpers are provided in

MACK SCHOOL BUS

front and rear. Five different seating arrangements are offered, and opportunity is afforded for variations from these plans.

An interesting use of a standard Mack school bus has been developed by J. D. Roszell Company, of Peoria, Ill., which is carrying children to its dairy plant on educational tours. The bus carries children not only from the public and parochial schools of Peoria, but from all the surrounding communities in southern Illinois.

Literature on the Mack school busses is available for any school official upon request.

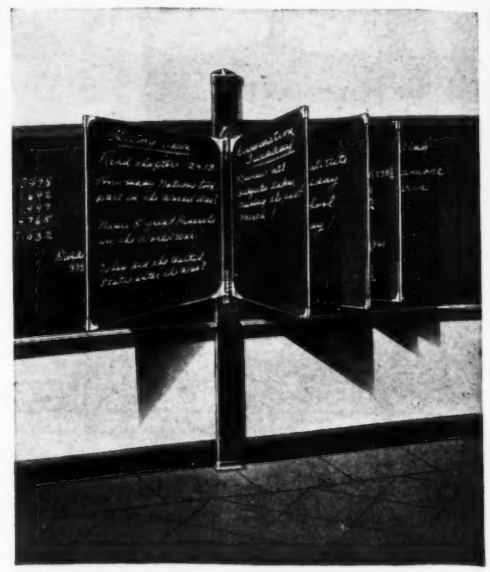
Sturtevant Subsidiary Changes Name. The Cooling and Air Conditioning Corporation has become a completely owned Sturtevant subsidiary. The name of the corporation will be the Sturtevant Cooling and Air Conditioning Company, with headquarters at Hyde Park, Boston, Mass.

The Sturtevant Corporation manufactures the unit type of air-conditioning products, such as coolers, humidifiers, or combinations of both.

Hild Company Opens New York Office. The Hild Floor Machine Company, of Chicago, Ill., has announced the opening of its New York office at 250 East Forty-third Street. The opening of the new office offers improved facilities for handling the school business of the Hild Company.

New Swinging Blackboards for Classrooms. The Richards-Wilcox Co., Aurora, Ill., has issued a descriptive circular, telling about the new R-W No. 795 swinging blackboard for classrooms. The new type of blackboard provides for 96 sq. ft. of blackboard surface in a space occupying only 24 sq. ft.

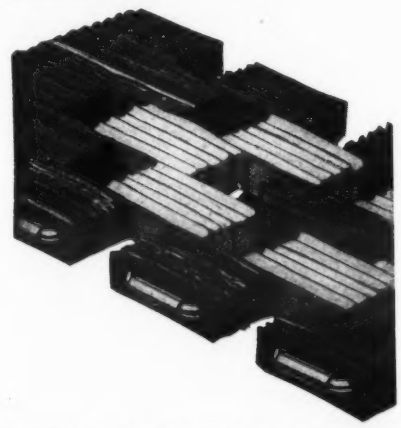
The swinging blackboard comprises four leaves which are attached to steel channels or other suitable structural members, securely fastened to the wall. A series of heavy hinges, attached to the channel by staggered knuckles, permits the four boards to fold parallel and tightly at any position. The hinge pintles are constructed of bronze to sustain several times the weight of the blackboards without sagging. In their rigid position, the boards swing easily from one position to another, yet they are so rigid that they may be written upon regardless of the position maintained.



NEW RICHARDS-WILCOX SWINGING BLACKBOARD

Each blackboard is double-faced, giving a total blackboard area of 96 sq. ft., or the equivalent of one stationary board 3 ft. high and 32 ft. long. All edges are protected by metal, and the corner pieces are solid bronze. Each end board has rubber bumpers to prevent marring the walls or blackboard.

Lynnlink Mats for School Floors. The Lynn Leather Washer & Mat Company, of Manchester, Conn., has just issued a useful six-page circular, describing and illustrating Lynnlink rubber and leather mats for school floors.



SECTION OF NEW LYNNLINK FLOOR MAT

The Lynn mats are clean, durable, and beautiful and are made to serve a twofold purpose — to provide a rugged, durable mat, and to offer protection as well as attractiveness. The mats combine a minimum floor obstruction, with maximum dirt-removing qualities; they are not readily clogged and can be instantly and completely cleaned. The mats are held together with rustproof wire links, which are indestructible and which enable the mat to withstand the most severe conditions.

Lynn rubber and leather mats may be obtained in a variety of standard sizes and color. Complete information will be sent to any school official upon request.

New Medart Catalog of Gymnasium Apparatus. The Fred Medart Manufacturing Company, St. Louis, Mo., has issued its new Catalog G–2, describing and illustrating its complete line of gymnasium apparatus.

The catalog contains 120 pages, devoted to various kinds and styles of gymnasium equipment, including parallel bars, vaulting horses, jumping boards, horizontal bars, ladders, stall bars, swinging booms, pulley weights, rowing machines, ceiling tracks, flying rings, giant strides, as well as a complete line of special fittings for apparatus, cabinets and racks for storing equipment, and basketball equipment.

A copy of the catalog will be sent to any school official who is interested.

New Catalog of Hallowell Steel Stools and Chairs. The Standard Pressed Steel Company, of Jenkintown, Pa., has just issued its latest catalog, illustrating and describing the Hallowell line of steel stools and chairs

The Hallowell line of steel furniture is complete, attractive, and durable, and contains those important features which insure comfort, strength, and good posture.

School officials who are interested may obtain complete information and prices upon request.

A PRACTICAL TEACHER OF PUBLIC SPEAKING

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A book you have been waiting for

Here is a public-speaking textbook that will "step-up" the efficiency and quality of your public-speaking courses.

A PRACTICAL TEACHER OF PUBLIC SPEAKING is packed full of good common sense. It is a book that will be a real asset to the instructor's work. It is written in a plain easy style that the students will like.

Every important phase of public speaking is covered—Effective Explaining, Sales Talk, Argument, Extemporaneous Speaking, The After-Dinner Speech, Conducting a Public Meeting, etc.

Scattered throughout the book are "human-interest" pen illustrations, such as the one above. They are humorous exaggerations of uses and abuses of the English language, platform faults and habits, etc., to stimulate student interest. At the close of each chapter is included a list of commonly mispronounced words and important grammatical constructions.

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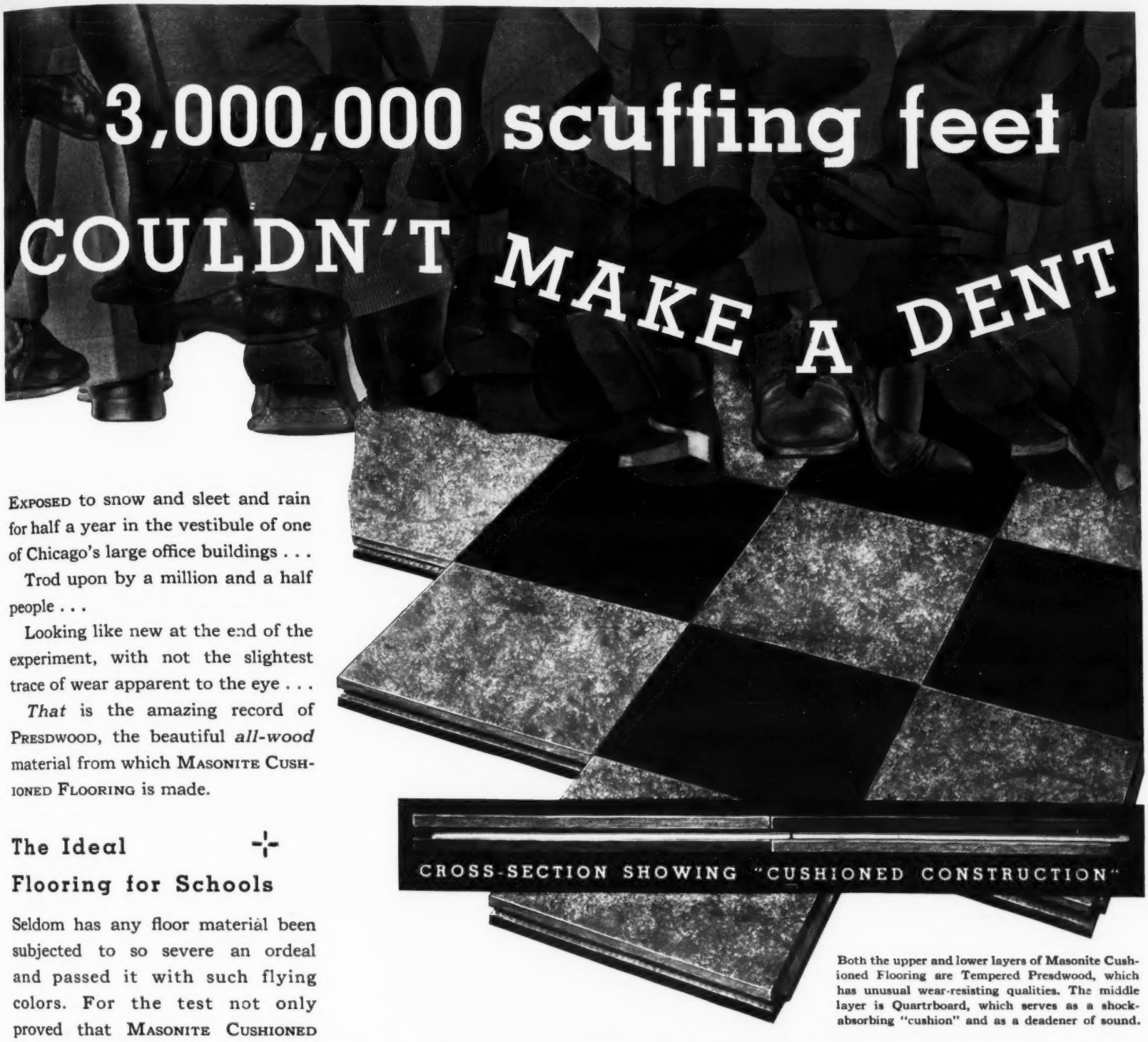

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EXPOSED to snow and sleet and rain for half a year in the vestibule of one of Chicago's large office buildings . . .

Trod upon by a million and a half people . . .

Looking like new at the end of the experiment, with not the slightest trace of wear apparent to the eye . . .

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Seldom has any floor material been subjected to so severe an ordeal and passed it with such flying colors. For the test not only proved that MASONITE CUSHIONED FLOORING can stand the toughest kind of punishment, but it also demonstrated its remarkable water-resisting qualities.

MASONITE CUSHIONED FLOORING is ideal for schools. The scuffing feet of schoolboys will not scar it. Hobnails make no dents. Boisterous horse-play cannot do any harm.

And this unusual flooring has a resilient, *in-built* shock-absorber . . . which helps to eliminate fatigue and discomfort in walking . . . and in addition serves as an effective deadener of shock and sound.

Coming in reversible squares and borders of rich-brown color, MASONITE CUSHIONED FLOORING can be laid in any number of attractive designs. It gives the appearance of an expensive sort of inlaid flooring; yet you will find that its cost is very low.

Investigate these Masonite Products

The reason for the remarkable durability of MASONITE CUSHIONED FLOORING is that its outer surfaces are made of PRESDWOOD . . . the amazingly versatile material for which new uses are being discovered every day. PRESDWOOD . . . and its companion material, QUARTRBOARD . . . are being utilized in many ways in schools. They are ideal materials for manual training classes. They make excellent blackboards. They can be used for screens, cabinets, drawers, shelves, partitions, panels, gymnasiums, and countless other things.

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